第　7　章

技　術　協　力　計　画　案

7　技術協力計画案

7.1　東京における技術協力方針の検討

今回の調査員を派遣するに当り，技術協力の方針について懇談会が開かれた。

日　時：1984年10月19日　於ＪＩＣＡ会議室

出席者：浅利裕（厚生省），今井義男（文部省），上西淳三（外務省），加藤茂孝（予研），高橋理明（阪大），林滋生（予研），平井富喜雄（文部省），深井孝之助（阪大），村田良介（予研），和気朗（予研），ＪＩＣＡ：伊藤清臣，熊倉晃，山中隆

討　議　要　旨

(1) 総花的協力を避け，タイＮＩＨの多くの部に必要な技術を優先する。但しなるべく具体的な問題をとりあげるように留意する。

(2) 研修生には有能な，将来性ある研究者を選ぶ。

(3) 技術協力の対象と考えられる分野：免疫学，感染症研究，生物製剤開発，動物実験センター，ＲＩ利用技術，バイオハザード室，プライマリヘルスケアに関係ある研究

(4) 技協にさいして供与する機材は，専門家の指導業務に必要なものを主とし，無償供与機材と重複しないよう留意する。

(5) 調査員はタイ側と協議のうえ，２年間の実施計画案を作成し，長期協力の構想を提案する。

(6) 地域センターについては，特定地域で共同研究の場として利用しかつ協力するよう配慮する。

(7) 技術協力開始の時期としては，1985年夏頃から可能であろう。

(8) 現役研究者の長期派遣は困難であるから，協力しながら現地で研究できるような計画が望ましい。タイＮＩＨが日本・タイ医学共同研究の場となるよう希望する。

7.2　技術協力上の問題点

(1) 医科学局職員の検査技術水準はかなり高く，新しい技術に対する関心も強いが，研究計画やデータの纏め方などに習熟していない。

(2) 医科学局ＮＩＨ関係職員中海外留学経験者は50余名もあり，在外期間中に良い研究業績をあげた研究者も少くないから，これらの研究者の能力を伸ばすような配慮が必要であろう。

(3) 感染症関係各部は，生化学，免疫化学あるいは微生物遺伝学の経験に乏しいから，最新技術導入の準備として，基礎的な技術指導が必要であろう。

7.3　技術協力計画案

7.3.1. 技術協力分野について

医科学局は，ＮＩＨの担当する研究のほとんどすべての分野に対する協力を期待していた（６－１参照）。各部を訪問すると，感染症関係部だけでなく，環境衛生科学，薬用植物学および食品科学などの部門でも日本の協力あるいは共同研究に対する期待が非常に大きい。とくに環境衛生問題はＮＩＨの重要研究対象となってきたので（6.3.9.参照），第２次優先順位として技協対象に加えて欲しいと，局長から要望があった（第１回協議）。各部を訪問し要請内容を聞くと，感染症や免疫学と共通の研究方法（例えばＲＩＡ，統計学，微生物毒素，動物実験法）を応用したいという希望が多く，また，ある分野では日本の資料を探し，あるいは研究者を紹介するという方法でも協力し得ると思われた。調査員は技協計画を作成するに当って上述の点を考慮して，３段階の協力方法を計画した。

第１群：専門家派遣あるいは研修員受入れによる技術協力を行う。免疫学，感染症関係研究部門，動物センター，機器センター，バイオハザード室，放射能室（後の２者は機器センターから独立することになった）。

第２群：第１群と共通な技術を利用できる研究分野。第１群関係派遣専門家による指導を主とし，少数の研修員を受入れる。例えば，環境衛生科学，薬用植物，食品科学などの部のＲＩＡ，微生物・動物を用いるBioassay，微生物毒素，抗生物質等に係わる研究。ＰＨＣに係る研究。

第３群：日本の資料の収集あるいは研究者の紹介等について助言を与える。例：環境科学，薬用植物，食品科学，薬学などの部門。

以上の方針のもとに，タイ側の要請を参酌して，各部の研究計画に対する技術協力要綱案を作成した（表７－１Ａ，Ｂ，資料３）

7.3.2. 専門家派遣案

日本側専門家派遣については表７－２の12分野を希望する。第７回協議議事録参照。

7.3.3. 研　修　員　案（表７－３）

表７－３に示す分野のタイ側研究者を日本において指導するよう希望する。第７回協議議事録参照。

7.3.4. 1985～86年専門家派遣および研修員受入れ計画案（第７回，第８回協議議事録参照）

医科学局長との協議により，今後２年間の技術協力計画を作成した（表７－４，表７－５）。研修員の番号は医科学局希望の優先順位を示す。遺伝学については医科学局職員の経験が少いので，研修期間18カ月を切望している。

専門家のうち，1985年のResaarch Planningについては細菌学およびウイルス学に各１名ずつ，当該部の研究全般についての指導者を要請している。期間については１年以上

という要請があった。しかし，人選が難しい場合も考慮して3～6ケ月とした。

生化学の専門家としては，蛋白化学および核酸に1名ずつ，なるべく3ケ月ぐらい滞在して実際的な技術指導をして欲しいと要請された。なお，日本からの専門家派遣以前に，カウンターパートはタイ国の専門家から生化学の基礎的講義をうけることになっている。

1986年の専門家のうち，動物実験センターとＲＩに係わる専門家は，新研究所竣工前に現地に到着し，施設整備に協力して欲しいと要請された。

7.3.5. 1987年以降の計画について （第9回協議議事録参照）

1986年末にＮＩＨ新庁舎が竣工する予定であるが，移転と整備を修了し研究活動が開始されるのは1987年3～4月の頃であろう。

1987年以降の協力内容について，医科学局と協議した計画案を表7－6に示した。具体的な計画については，1985～1986年の協力実施の進行状況などをみてから，1986年後半に作成したいと考えている。今後の計画案作成については，ときどき中間評価調査団あるいは計画協議調査団などを派遣し，現地チームリーダーおよび医科局と協議するよう要望する。

7.4. 機材供与について

7.4.1. 医科学局現有機材

医科学局各部および4ケ所の地域医科学センター視察の際に，現在保有している機材の詳細なリストを作成した。1日，半日，時には1時間で各部を廻ったので，一部分点検もれはあるとは思われるが，最新の機器リストである（資料1－2参照）。このリストには移動する部，移動しない室などに関係なく，全ての機械を含めてある。但し，臨床病理部（ＣＰ）の生化学の室の機械のみは含まれていない。

各部の機器を点検していて気づいた点を以下に述べる。

(1) 機器の数量は，極めて多い。リストを作成して比較すると，同一機器が数多く，各部又は各室毎に保有しており，重複の多いのが特徴である。この原因は，幾度かの技術協力で同一機種を要求してきた事と，後述の部，室のセクショナリズムの故で，共同利用が行なわれていないからである。重複機器の例としては，分析用又は，電子バランスが53台，ガスクロマトグラフィー15台，化学フード61台，凍結乾燥機9台，オーブン（真空オーブン，マッフル炉を含む）69台，冷蔵庫約100台，水浴槽51台などである。

(2) 最新の機器は多くない。一部薬学関係の部（食品分析，薬品分析，薬用植物）を除くと，比較的旧式の機器であり，新鋭機器が少ない。

(3) 機器の保守がやや悪い。現地タイ国の代理店の能力の問題が一つあるが，空調設備の不良な為もあると思われる。特に，はなはだしいのが凍結乾燥機で9台保有している内の，4台が使用不能である。ＮＩＨでは，空調が完備しているので，空調が原因の故障は無くなることが期待できる。

(4) 各機器への習熟度にややかける。各機器を使いこなそうという工夫がややかけていると思われる事象にでくわす事がある。例えば，顕微鏡写真の撮影装置が，自動でないので，新品のまま全く使わないとか，顕微鏡の焦点をカメラのフィルム面と，うまくあわせられないので，1台新品を希望する等の問題があった。機器への習熟よりも，全自動で最新機種を望むという姿勢は，かなり全体にわたって強かった。

(5) セクショナリズム，他の部で保有する機器を使わない。又は，他の部員には使わせない傾向がある。はなはだしい場合は，これが室にも及んでいて，各室が個有の機材を所有することになる。これは機材の共同利用という観点以外にも，技術交換，知識の交換，という点で，はなはだ望ましくない傾向である。

(6) 研究計画と機器との関連性が低い。研究の遂行上，その機材が必要になるという論理的つながりが弱い所が見られる。新鋭機材を入手使用すれば，新しい研究が生れるかの如き，錯覚がある。これは一つには，世界のトップレベルとの隔絶の大きさ故であり，今一つには，機材は無償で供与される習慣が身についているからであると思われる。

(7) 地域医科学センターは，機材に比較的乏しい（資料1－3参照）。

以上の様な現有機器の保有および使用状況なので，以下の様な改善が望まれよう。

A．同一機種の重複を避け，主要機器は中央化して共同利用する。

B．機器使用に当って，十分トレーニングし，機器に習熟すること。その為にも，技術および知識の交換をすること。

C．余分な機器は，地域医科学センターへ廻すこと。

D．過度の無償供与は疑問である。自力調達の道を探ること。自力調達のためには，必要性の検討，共同利用，機材への習熟，有効利用等が当然問題となってくるので，機材の重要性の認識が高まるものと期待される。

7.4.2. 無償供与機材について

無償供与には，約4億円余りの機材が予定されている。既に大略が決められているが，今回の調査の折，現有機材の点検の際に感じられた問題点を，出来得る限り避けるために第一医療施設コンサルタンツの伊沢恭一氏と相談の上，タイ医科学局の同意を得て，以下の如く多少の修正案をつくった。その折の基本方針はつぎの通りである。

(1) 不必要な機器を削除する。

(2) 国産品を調達できるものは，タイ国産品を購入する。

(3) 技術協力で供与希望が出ている機材で大型または高価なものは，出来るだけ無償で供与する。

(4) 共同利用をすすめる為に，主要機器は中央化して，科学機器センターに集める。

修　正　案

(1) 削除したもの：電子顕微鏡室のオートクレーブ。リケッチア室の安全キャビネット。

マイクロフィルムシステム。ウサギ用隔離感染箱。

数をへらした機器：マウス・ラット用隔離感染箱。

機種を変更したもの：超音波洗浄器（２台）→自動水洗器（２台），ＲＩ室のChacoal fiter → regular filter。

(2) 国産化。動物ケージとケージ棚。

(3) 追加。ＮＭＲ（核磁機器共鳴装置），ガスクロマトグラフィー５台（地域医科学センター用），ＨＰＬＣ（高速液体クロマトグラフィー）用部品，ガスクロマトグラフィー用部品，分光光度計用部品。

(4) 中央化。自動水洗器，エチレンオキサイドガス滅菌器，ドライアイスメーカー，液体クロマトグラフィー１台，ガスクロマトグラフィー１台。また蒸留装置を各階に中央化。

無償の機材については，今回の修正案でかなりの改善されると思われる。計画当初から研究者と機器コンサルタンツが，うまくペアを組んで時間をかけて検討すれば，更によい結果が得られた事と思われる。無償機材修正案一覧表（資料１－４参照）を作成してみて，多少機材の重複が見られるが，修正し難いだろう。例えば，安全キャビネット28台，クリーンベンチ14台，自記温湿度計36台，キャスター付作業台23台などがそれである。

7.4.3. 技術協力の希望機材

尨大な機材の希望（資料１－１参照）があったが，２度に亘って医科学局内で自力調整をしてもらった。機器選択に当っては，無償の機器の場合と同様の方針を立てた。

(1) 現有および，無償の機器との重複を避ける。

(2) 高価な機器および，無償機器の付属部品は無償の方へ廻し，技術協力機器への負担を軽くする。

医科学局側と２回議論し，表７－７のリストを作成した。希望年度は，医科学局側の希望順位にすぎず，専門家の派遣計画，各年度の予算総額，派遣専門家の意見によって，決めれば良いであろう。資料１－５および１－６には現地で入手し難い試薬・消耗品を記載したが，これも派遣専門家の意見によって，決めればよいであろう。

7.5. 国立衛生研究所の予算および定員

表７－８に1987年度ＮＩＨ予算案（1986年10月～1987年９月）を示した。この案には人件費は含まれていない。５年後には18,000,000バーツに増額される見込みである。

表７－９～11にＮＩＨの定員及び増員計画を示した。カッコ内の数はＮＩＨにおいて独立する"単位"の内訳を示す。ＮＩＨ定員（1986）のうち事務部を除いた298名が研究部に配属されるが，この中の101名は医・理・薬・獣医系大学出身者で，その内にはMD・PhD13，修士33，獣医６名が含まれている。また，101名中53名（52.5％）は日本，欧米に留学した経験がある。このほか，ＷＨＯの研修等で外国を訪れたものが13名ある。

表7－1(A) 技術協力要綱（案）

技術協力は全国民の健康増進のために実施される。	
技術協力計画	NIHにおいて達成すべき目標
（研究分野）	
1. ウイルス学	
1.1. ウイルス性疾患の研究，診断，サーベイに対する協力	1.1. 全国にウイルス学に関する情報を提供，感染症迅速診断のためのReference Laboratory Center を整備する。
1.2. 分子ウイルス学研究協力：単クローン抗体，新ワクチン開発研究およびインターフェロンの研究など指導	1.2. ウイルス学の基礎的・応用的研究を推進す
1.3. リケッア，クラミジア，癌原性ウイルス研究室設立に協力	1.3. 新しい研究分野の開拓
2. 細菌学，真菌学，寄生虫学	
2.1. 細菌，真菌，寄生虫に起因する各種疾患の病因，疫学，免疫学の研究に協力；診断技術改善に対する協力	2.1. Reference Laboratory Center を整備する。
2.2. 細菌，真菌の病原性に関する研究指導	2.2., 2.3. 細菌学，真菌学，寄生虫学における基礎的応用的研究を推進する
2.3. 細菌遺伝学に関する研究指導	
3. 免疫学 最新の免疫学的技術導入に関する指導	3. 感染症その他人間の健康に係わる免疫学的現象の諸問題の研究を推進する
4. 生物製剤	
4.1. 国産および輸入製剤の品質管理，およびEPI計画に関する協力	4.1. 生物製剤の安全性及び有効性などの品質を管理する
4.2. 新生物製剤の開発に関する協力	4.2. 有効な新生物製剤を開発する
4.3. 細菌学，ウイルス学における遺伝学的研究指導	4.3. 生物学分野における最新の知識と技術を獲得する
5. 医昆虫学	
5.1. ベクターの生物学・生態学の研究促進に協力	5.1., 5.2. ベクターにより媒介される疾患を予防撲滅する
5.2. ベクター媒介疾患の予防・制圧・方法研究に助言	
6. 薬用植物学 薬用植物の研究に助言：植物栽培，薬理学，動物実験および臨床研究（感染症治療薬，PHCに必要な薬用植物）	6. 薬用植物製剤を開発，利用する
7. 食品の生物学・医学的研究 食品汚染物質（主に毒素など）の検索方法に関する助言	7. 国内で利用される食品の品質管理を行う

技術協力計画	NIHにおいて達成すべき目標
8. 環境衛生科学	
8.1. 生活環境における毒性物質の理化学的検査法に関する助言 8.2. 環境汚染毒性物質の動物試験—病理組織学的研究指導	8.1., 8.2. 国民の安全と健康のために毒性物質による汚染を予防しまたは除去する
9. 薬理学	
9.1. 医薬品管理におけるRIA，機器分析，微生物学的方法（抗生物質等），動物実験法に関する指導 9.2. RIを利用する医療器具の製造および品質管理に関する助言	9.1. 医薬品の適正量および有効性などの品質管理を行う 9.2. 病院の利用に供する
10. 動物実験センター	
10.1. 実験動物の購入，検疫，飼育に関する助言 10.2. 実験中の動物の飼育管理，感染動物の取扱い方法等の指導	10.1, 10.2. 動物実験センターとしての機能を充実する
11. 科学機器センター	
11.1. 研究者の機器使用に協力 11.2. NIHのコンピュータシステム設定に協力	11.1. NIHで使用される機器類の購入，整備，利用，保守，精度管理などの業務に協力する 11.2. コンピューターシステムの適正な運営を行う
12. バイオハザード室 P3用研究室整備に協力	12. 危険性の高い微生物による疾患の診断および研究を行う
13. RI実験室	
13.1. 化学物質および微生物学的検査におけるRIA技術指導 13.2. 微生物学，毒物学，薬学，薬理学におけるRI利用技術指導	13.1., 13.2. RI技術利用者の研究を援助する。
14. 研修計画 NIHのつぎの研修計画に協力	
14.1. ウイルス学および関連分野 14.2. 高度な技術を要する機器分析法 14.3. 全国の科学者に対するセミナーおよびワークショップ	14.1. 科学者の研究能力を高める 14.2., 14.3. 国内における情報センターとしてサービスする

表７－１(B)　タイ国立衛生研究所技術協力計画案概要

ＮＩＨ部門	ウイルス学	細菌学	真菌学	寄生虫学	免疫学	医昆虫学	生物製剤	環境衛生科学	食品研究	薬用植物学	薬理学
感染症病因学的研究	クラミジア(a) リケツチア(a) ウィルス性疾患(a)	マイコプラズマ(a) 日和見感染(a) 気道感染(a) 腸管感染(a) 新分類法(a)	疫学(b)	実態調査(a)		ベクター生態学(a) 生物学的防除(a)		微生物学的試験法(b)	微生物学的試験法(b)		
感染症生化学的研究	分子疫学(a)	細菌毒素(a) 病原性(a)	病原性(b)		生化学基礎技術(a)	ベクター化学的防除(a)	生化学基礎技術(a)	毒素学的技術(b)	毒素学的技術(b)		
感染症免疫学的研究	単クローン抗体(a) 血清疫学(a)	単クローン抗体(a)		免疫学的診断法研究(a)	免疫化学(a) 単クローン抗体(a) 細胞性免疫(a)		免疫化学(a)		ＲＩＡ応用(b)	ＲＩＡ応用(b)	ＲＩＡ応用(b)
微生物遺伝学研究	ウィルス遺伝学(a)	細菌遺伝学(a)			微生物遺伝学基礎技術(a)		微生物遺伝学基礎技術(a)	細菌遺伝学基礎技術(b)			
生物製剤開発研究	ワクチン開発基礎研究(a)				ワクチン開発基礎研究(a)		生物製剤管理(a) ワクチン開発改良研究(a) 日脳，狂犬病，百日咳 免疫グロブリン(a)				
その他	診断試薬等開発改良(b)	診断試薬等開発改良(b)		診断用抗原試作(b)		ベクター防除野外研究(c)		病理学的技術(b)		動物試験法(b) 情報収集(c)	動物試験法(b) 情報収集(c)
ＲＩ技術	(a)	(a)		(a)				(b)	(b)	(b)	(b)／(c)

共同施設関係	1. 動物実験センター：(1) 動物飼育・繁殖(a)　(2) 実験的感染病理学(a) ── 各部と協力 2. 機器センター：コンピュータシステム開発(a) ── 各部と協力

注１：(a)技術協力主要対象（本文7.3.1第１群）(b)(a)に関する派遣専門家の指導によるもの（7.3.1第２群）(c)情報提供及助言（7.3.1第３群）

表7－2　専門家派遣分野

1. Bioassay
2. Biotechnology[1)]
3. Immunochemistry
4. Immunology[2)]
5. Biochemistry
6. Radio-isotope technique
7. Animal Experiment Center
8. Biological products research
9. Microbiology
10. Research planning
11. Statistical analysis in Biomedical Research
12. Others[3)]

Note : 1) Biotechnology includes the following areas

- Genetic study in bacteriology and virology
- Study on production of viral vaccine, using genetic engineering
- Study on production of bioactive substances using genetic engineering.

2) - Cell mediated immunity
- diseases related to immunological phenomenon

3) including the strengthening of activities of Regional Medical Sciences Centers.

表7－3　研修員受入分野

1. Bioassay
2. Biotechnology[1)]
3. Immunochemistry
4. Immunology[2)]
5. Biochemistry
6. Radio-isotope technique
7. Animal Experiment Center
8. Research on new biological products
9. Others[3)]

Note: 1) Biotechnology includes thn following areas

- Genetic study in bacteriology and virology
- Study on production of viral vaccine, using genetic engineering
- Study on production of bioactive substances using genetic engineering.

2) - Cell mediated immunity
- Diseases related to immunological phenomenon

3) including the strengthening of activities of Regional Medical Sciences Centers.

表7－4　1985－1986年度研修員受入計画案

1.	Genetic study of bacteriology	1/18	man/month
2.	Genetic study of virology	1/18	man/month
3.	Cellular immunity in relation to viral diseases (eg. rabies, herpes)	1/12	man/month
4.	Bioassay and method development for new biological product (immunoglobulin)	1/12	man/month
5.	Radio-isotope technique	1/12	man/month
6.	Animal care	1/12	man/month
7.	Experimental pathology	1/12	man/month
8.	Immunochemistry	1/12	man/month
9.	Biochemistry of toxic substances	1/12	man/month
10.	Study on production of viral vaccine using genetic engineering. (further study of item 2)	1/12	man/month
11.	Study on production of bioactive substances using genetic engineering eg. hormones, antibiotics, interferon (further study of item 1)	1/12	man/month
12.	Molecular biology for the research and development of biological control of mosquitoes.	1/12	man/month

表7－5　1985－1986年度専門家派遣計画案

1985

Research planning and design	2/3-6	man/month
Biostatistical analysis in biomedical research	1/3-6	man/month
Biochemistry	2/4-6	man/month
	(1/2-3	each)
Radioimmunoassay	1/3-6	man/month

1986

Animal Experiment Center	1/12	man/month
Mycotoxins	1/3-6	man/month
Radio isotope	1/6	man/month
Mosquito ecology	1/3-6	man/month
Biological product development (JE)	1/3	man/month

表７－６　技術協力の将来計画案（1987年以降）

- Application of monoclonal antibody and oligonucleotide fingerprinting technique in the study of epidemiology of viral diseases (JE, dengue, HF, rabies).
- Epidemiological and etiological study of gastrointestinal and respiratory (bacterial) infections by the application of new taxonomical method such as DNA-DNA hybridization etc.
- Study of mode of infection and immunity concerning pathogenicity in term of molecular biology in some bacterial diseases, et. those caused by gram negative bacilli and anerobic bacteria.
- Development and control of new biological products.
    1) Development of new vaccines: rabies tissue culture vaccine; JE and HBs vaccines.
    2) Improvement of pertussis vaccine.
    3) Research on live typhoid and cholera vaccines.
- Drug resistancy of microorganisms and parasites including genetic study.
- Research and development of biological control of vectors such as mosquitoes.
- Study on effects of food contaminants on health with special reference to microbial toxins and microorganisms.
- Research and development of rapid and appropriate diagnosis methods of infectious diseases for using at regional and peripheral laboratories eg., food poisoning.
- Application of microbiological method in the study of carcinogenic substances.
- Study on medicinal plants for using against the infections diseases, cancer and bioassay of some new drugs.

表7－7 技術協力に必要な機器

Description	Unit price ¥ x 1000	1985	1986	1987
1. Virology				
1. Electrophoresis apparatus	735	1		
2. Ultrasonic cell disruptor (generator 200 - 300 watt, 5 - 10 K, cooling jackets, titanium tip :- standard size and microtip.	1,000			1
2. Bacteriology, Mycology, Parasitology				
1. Automatic agar dispenser	840	1		
2. N_2- O_2- CO_2 incubator Espec Co. model LNP 120 : 60 x 10 x 81 cm	1,240		1	
3. Medical Entomology				
1. BOD, COD, DS, O_2 consumed rapid analyzer	580			1
4. Medicinal Plant				
1. Water aspirator and cooling bath (Eyela Labo Instrument A_{25}, CA - 101)	372	1		
2. Water bath for evaporator (Eyela SB - 35) with 200 x 200 mm lab jack	112	1		
5. Biomedical Research on Food				
1. Refrigerator/Freezer, explosion proof 14 Cu ft.	450			1
6. Pharmaceutical Sciences				
1. Syringe pump "Triple channel" for infusion only	335		1	

Description	Unit price ¥ x 1000	1985	1986	1987
2. Nephelometer	620			1
3. Vacuum oven	400			1
7. Animal Center				
1. Metabolic cage of transparent polycarbonate and polymethylpentene with cage accessories (filter cover, water bottle, card holder, cage racks)		24		
2. Statham Transducer ± 30 g, ± 0.6 mm input 7.5 V max or equivalence		1		
3. Coulter counter for leukocyte counting in Pertussis vaccine			1	
4. Electric hand dryer			1	
5. Electric pump and sprayer			1	
6. Inhalation chamber				1
8. Radioisotope Laboratory				
1. Refrigerated centrifuge (10,000 rpm)	2,480	1		
2. Freeze dryer	420			1
3. Refrigerator	173			1
4. Tissue Homogenizer	620			1
5. Electrophoresis apparatus set				
- Agarose Gel			1	
- PAGE			1	
- Slab gel dryer			1	

Description	Unit price ¥ x 1000	1985	1986	1987
6. Fraction collector	1,364			1
7. Radiochromatograph scanner	1,860			1
9. Office of Secretary				
1. Vehicle				
- Station wagon (diesel)		1	1	
- micro-bus (diesel)		1		

表7－8　N. I. H. の 予 算

	Item	year 1987
1	Public Service 1.1 Electricity 4,200,000 bath (350,000/month) 1.2 water Supply 300,000 bath (25,000/month) 1.3 Postage 100,000 bath 1.4 Telephone 300,000 bath (25,000/month) (The increment of budget 5% for each year)	4,900,000
2.	Laboratories and Services Supplies 2.1 laboratories supplies,chemical,glassware,experimental aminals and accessories 5,000,000 bath 2.2 Fuel 200,000 bath 2.3 Supplier 720,000 bath (The increment of budget 10% for each year)	5,920,000
3.	Service 3.1 Freight and Tax 300,000 bath 3.2 Repairing equipments and spare parts 1,000,000 bath 3.3 Travel expenses 500,000 bath 3.4 Service charge 500,000 bath (the increment of budget 10% for each year)	2,300,000
4.	remuneration 4.1 Overtime 100,000 bath 4.2 Rent and Allowance 100,000 bath (the increment of budget 10% for each year)	200,000
	Total	13,320,000

表 7－9

Department of Medical Sciences, Thailand

Personnel in 1985 - 1987

	1985	1986			1987		
	DMS	MIN	MSL	DMS	NIN	MSL	DMS
1. Office of Secretary	73	30	76	106	31	78	109
2. Div. of Radiation Protection Services	39		39	39		40	40
3. Div. of Health Laboratory Quality Control	48		48	48		49	49
4. Div. of Drug Analysis (Pharmaceutical Sciences)	138	14	124	138	17 (17)	126	143
5. Div. of Medical Entomology (Medical Entomology)	75	70		70	73 (73)		73
6. Div. of Toxicology (Environmental Health Sciences Research)	40	4	40	44	10 (10)	41	51
7. Div. of Clinical Pathology (Bacteriology) (Parasitology) (Mycology)	68	42 (31) (5) (6)	11	53	44 (31) (6) (7)	11	55
8. Virus Research Institute (Virology) (Immunology)	78	73 (64) (9)		73	88 (75) (13)		88
9. Div. of Medical Research (Development and Control of Biological Products)	151	69 (10)	75	144	80 (17)	77	157
(Medicinal Plant Research)		(59)			(63)		
10. Div. of Food Analysis (Biomedical Research in Food)	109	11	102	113	12 (12)	104	116
11. Scientific Instrument Center	6	7	1	8	10	1	11
12. Animal Experiment Center		8		8	10		10
13. Regional Center of Medical Sciences (6)	213		213	213		217	217
Total	1038	328	729	1057	375	744	1119

表 7－10

NIH Personnel in 1986 - 1991

	1986	1987	1988	1989	1990	1991
1. Office of Secretary	30	31	36	40	43	46
2. Pharmaceutical Sciences	14	17	20	22	24	26
3. Medical Entomology	70	73	75	77	78	79
4. Environmental Health Sciences Research	4	10	14	17	19	20
5. Clinical Pathology	42	44	45	46	47	48
6. Virology	64	75	81	87	93	98
7. Immunology	9	13	17	21	25	28
8. Development & Control of Biological Products	10	17	22	26	29	32
9. Medicinal Plant Research	59	63	66	68	70	73
10. Biomedical Research in Food	11	12	13	14	15	16
11. Scientific Instrument Center	8	10	13	14	17	19
12. Animal Experiment Center	8	10	11	12	13	14
Total	328	375	413	444	473	499

表 7－11

Increment of Manpower of NIH from 1987 - 1991

	1986 (Total)	Increment				
		1987	1988	1989	1990	1991
1. Office of Secretary	30	1	5	4	3	3
2. Pharmaseutical Sciences	14	3	3	2	2	2
3. Medical Entomology	70	3	2	2	1	1
4. Enironmental Health Sc. Research	4	6	4	3	2	1
5. Clinical Pathology	42	2	1	1	1	1
6. Virology	64	11	6	6	6	5
7. Immunology	9	4	4	4	4	3
8. Development and Control of Biological Products	10	7	5	4	3	3
9. Medicinal Plant Research	59	4	3	2	2	3
10. Biomedical Research in Food	11	1	1	1	1	1
11. Scientific Instrument Center	7	3	3	1	3	2
12. Animal Experiment Center	8	2	1	1	1	1
Total	328	47	38	31	29	26

. 7. 6. Draft Document to be attached to Record of Discussion

on

The Technical Cooperation of the National Institute of Health Project

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I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of Japan and the Government of the Kingdom of Thailand will cooperate with each other in implementing the National Institute of Health Project (hereinafter referred to as "the Project") for the purpose of extending technical advice, guidance, training on medical science researches to control important diseases prevailing in Thailand for the success of human resource development through the promotion of - health of the people in Thailand. The project will be carried out at the National Institute of Health which will be constructed by the Japanese grant assistance under the Exchange of Notes dated June 8, 1984.

2. The Project will be implemented in accordance with the Master Plan which is given in Annex I

II. DISPATCH OF JAPANESE EXPERTS

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide at its own expense services of the Japanese experts as listed in - Annex II through the normal procedures under the agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand.

2. The Japanese experts referred to in 1 above and their families will be granted in the Kingdom of Thailand the privileges, exemptions and benefits no less favourable than those accorded to experts of third countries working in the Kingdom of Thailand under the agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand.

III. PROVISIONS OF MACHINERY AND EQUIPMENT

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to provide at its own expense such machinery, equipment and other materials necessary for the implementation of the Project as listed in Annex III through the normal procedures under the agreement on Technical Co-operation between the Government of Japan and the Government of the Kingdom of Thailand.

2. The articles referred to in 1 above will become the property of the Government of the Kingdom of Thailand upon being delivered c.i.f. to the Thai authorities concerned at the ports and/or airports of disembarkation, and will be utilized exclusively for the implementation of the Project in consultation with the Japanese experts referred to in Annex II

IV. TRAINING OF THAI PERSONNEL IN JAPAN

1. In accordance with the laws and regulations in force in Japan, the Government of Japan will take necessary measures through JICA to receive at its own expense the Thai personnel connected with the Project for technical training in Japan as listed in Annex IV through the normal procedures under the agreement on Technical Cooperation between the Government of Japan and the Government of the Kingdom of Thailand.

2. The Government of the Kingdom of Thailand will take necessary measures to ensure that the knowledge and experience acquired by the Thai personnel from technical training in Japan will be utilized effectively for the implementation of the Project.

V. MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE KINGDOM OF THAILAND

1. In accordance with the laws and regulations in force in the Kingdom of Thailand, the Government of the Kingdom of Thailand will take necessary measures to provide at its own expense :

   (1) Services of the Thai counterpart personnel and administrative personnel as listed in Annex V

   (2) Land, buildings and facilities as listed in Annex VI

   (3) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than those provided through JICA under III above ;

   (4) Transportation facilities and travel allowance for the Japanese experts for the official travel within the Kingdom of Thailand;

   (5) Suitably furnished accommodations for the Japanese experts and their families.

2. In accordance with the laws and regulations in force in the Kingdom of Thailand, the Government of the Kingdom of Thailand will take necessary measures to meet :

   (1) Expenses necessary for the transportation within the Kingdom of Thailand of the articles referred to in III above as well as for the installation, operation and maintenance thereof;

   (2) Customs duties, internal taxes and any other charges, imposed in the Kingdom of Thailand on the articles referred to in III above;

   (3) All running expenses necessary for the implementation of the Project.

VI. ADMINISTRATION OF THE PROJECT

1. The Director General of the Department of Medical Sciences, Ministry of Public Health, will bear over all responsibility for the implementation of the project.
2. The Director of the NIH, appointed by the Ministry of Public Health, will be responsible for the administrative and operational matters of the project.
3. The Japanese Team Leader will assume the control of the Japanese experts and advise the Director of NIH and if necessary, the Director General of DMS, Ministry of Public Health, on technical and administrative matters concerning the implementation of the project through the Joint and Executive Committees.
4. The Japanese experts will provide technical guidance and advice to the Thai counterpart personnel in the concerned fields under the project.
5. There will be close consultation on any matters concerning the implementation of the project between both sides. For this purpose the JOINT COMMITTEE and the EXECUTIVE COMMITTEE will be appointed by the Ministry of Public Health with the composition and functions as below

THE JOINT COMMITTEE

A. Composition

(1) Chairman	: Permanent Secretary, MPH
(2) Thai side	Director General, DMS
	Deputy Director General, DMS
	Director, NIH
	Principal Medical Official, MPH
	Representative of University Affairs Office.

(3) Japanese side : Team Leader

Director of JICA (Thailand)

Representative of the Japanese Embassy.

Note : If necessary the high level officials of DMS/NIH and the individual experts may attend the Joint Committee as observers.

B. Functions

The Joint Committee will meet at least once a year or whenever necessity arises and work in the following scopes.

(1) To formulate research policy in line with the project master plan and objectives.

(2) To evaluate the progression of the project,

(2) To advise the two governments on

- the implementation of the project
- budgetary matters
- recruitment of Thai counterpart personnel
- others

(3) To appoint the subcommittees, when necessary, for execution of specific activities.

THE EXECUTIVE COMMITTEE

A. Composition

(1) Chairman : Director, NIH

(2) Thai side : 2-Deputy Directors, NIH

2-Principal scientists, NIH

2-Senior scientists, NIH

Representative of DTEC

(3) Japanese side : Team leader

Representative of JICA (Thailand)

Liaison officer

Note : If necessary, official of the Embassy of Japan and individual experts designed by the Team leader may attend the Executive committee as observers.

8. Functions

The Executive Committee will meet monthly or whenever necessity arises for the following responsibilities:

(1) To review the overall progression of the implementation in line with the master plan and Joint committee policy and its recommendations.

(2) To review those measures taken by the Government of Japan, ic:

(1) Dispatch of Japanese experts:

(2) Acceptance of Thai counterpart personnel in Japan for Training:

(3) Provision of Machinery and Equipment:

(3) To review those measures taken by the Government of the Kingdom of Thailand, ie:

(1) Allocation of necessary budget (including local cost - expenditures);

(2) Allocation of necessary counterpart personnel.

(3) Utilization of machinery and equipment provided by the Government of Japan;

(4) To formulate the Annual operation plan of the Project.

(5) To recommend to the two Governments particularly on:

(1) Appointment of the Thai counterpart personnel.

(2) Effective utilization of machinery and equipment.

(3) Appropriate dispatch of Japanese experts.

(4) Acceptance of Thai counterpart personnel in Japan for training.

(5) Others

VII. CLAIMS AGAINST JAPANESE EXPERTS

The Government of the Kingdom of Thailand undertakes to bear claims, if any arises, against the Japanese experts engaged in the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in the Kingdom of Thailand except for those arising from the willful misconduct or gross negligence of the Japanese experts.

VIII. MUTUAL CONSULTATION

There will be mutual consultation between the two Governments on any major issues arising from, or in connection with this Attached Document.

IX. TERM OF COOPERATION

The duration of the techmical cooperation for the Project under this Attached Document will be.....from.....to.....

Annex 1 Master Plan

1. Objective

The NLH will carry out health sciences research to promote health laboratory service and medical care of the whole nation. Fundamental and applied research in different fields of microbiology and environmental health are to carry out to solve health problem, consumer protection, diseases - prevention and control, and to support the Primary Health Care Project. Seminar and workshop as well as training course will be conducted in order to disseminate the health science research work. The institution will act as the national information center and coordinator of health science services.

The aim of the Japanese Technical Cooperation is to promote research activities necessary for the prevention and treatment of the infections diseases prevailing in Thailand.

2. Activities

Technical Cooperation Project	
The project activities	Target to be acheived at NIH
The main project activities are to support health promotion of the whole nation.	

(Research activities)

1. Virology

1.1 To cooperate in studies on diagnosis, survey, and research in virus diseases.	1.1 To provide virological information of the whole country and establish a reference laboratory center for rapid diagnosis of the infectious diseases.
1.2 To raise the capability to study on molecular virology, interferon, monoclonal antibody and biotechnology for the new wiral vaccines.	1.2 To promote the basic research on fundamental and applied virology.
1.3 To establish a laboratory for rickettsia, chlamydia and oncogenic virus.	1.3 To develop new field of research.

2. Bacteriology, Parasitology, Mycology

2.1 To cooperate to improve the laboratory technique and to carry out research work on etiology, epidemiology and immunology of various bacterial, parasitic, mycological diseases. 2.2 To raise the capability to study on the pathogenicity of bacteria. 2.3 To train on study on bacterial genetics.	2.1 To establish a standard central and reference laboratories of the country. 2.2, 2.3 To promote the research on fundamental and applied bacterialogy, mycology and parasitology.

3. Immunology

3.1 To upgrade the capability to use advanced immunological techniques.	3.1 To promote the research to solve the problems on the immunological phenomenon of infectious diseases and of human health

4. Biological Products

4.1 To cooperate to perform the quality control and biological standardization of biological products locally produced and imported and to support EPI Programme. 4.2 To cooperate in the research on development of new biological products. 4.3 To raise the capability to study genetics for bacteria and virus and recombinant DNA technology.	4.1 To ensure the quality of biological product for safety and efficacy. 4.2 To produce the efficient new biological products. 4.3 To obtain the advanced knowledge and technology in the field of biological work.

5. Medical Entomology

5.1 To cooperate to promote the study on the biology and ecology of vectors. 5.2 To advise on the study the suitable way to prevent and combat the outbreak of vector borne diseases.	5.1, 5.2 To prevent and control vector borne diseases.

6. Medicinal Plant

6.1 To advise on the research on medicinal plant including cultivation, pharmacological and toxicological studies in experimental animals and clinical trials.	6.1 To produce and utilize the plant product obtained from the studies.

7. Biomedical research on food

7.1 To advise on method for analysis of food contaminants.	7.1 To control the quality of food distributed all over the country.

8. Environmental Health Sciences

8.1 To advise on the evaluation of toxic substances in human environments caused by chemical positions and other natural sources by physico-chemical means.	8.1, 8.2 To prevent and control the toxic substances in order to ensure the public safety and health promotion.
8.2 To raise the capability to conduct the histopathological study of experimental animals used for the test of the environmental toxic substances.	

9. Pharmaceutical Sciences

9.1 To advise to upgrade the capability to conduct the quality assessment of medicines by RIA, physico-chemical, microbiological and animal assays.	9.1 To control the quality of pharmaceutical products in dosage form as well as the efficiency of medicines in form of therapeutic equivalence.
9.2 To advise to prepare and perform the quality control of radiopharmaceutical products.	9.2 To distribute to the hospitals.

(Supportive activities)

1. Animal Experiment center

1.1 To advise to purchase, acquire, quarantine and housing of normal animal for experimentation.	1.1 1.2 To act as a center for animal experiment facilities.
1.2 To raise the capability to manage animal for experimentation, housing, control and sacrification of infected animals.	

2. Instrumentation services

2.1 To assist the researcher in the area of technical instrumentation.	2.1 To support the main activities at NIH in terms of procurement, installation, utilization, maintenance and quality assurance of instrumentation.
2.2 To set up hardware, possible soft ware and to implement support for the NIH's Computer network.	2.2 To manage the computer system for smooth application.

3. Biohazard Laboratory

3.1 To set up the P.3 facility laboratory.	3.1 To diagnose and study the diseases caused by highly hazardous microorganisms.

4. Radioisotope Laboratory

4.1 To raise the capability to conduct the radioimmuno assay experiments of microbiological and chemical substances.	4.1, 4.2 To fulfill the study by using radioisotope technique.
4.2 To cooperate to carry out the radioisotope technique in the area of microbiology, toxicology, pharmacy and pharmacology.	

(Training)

1. To advise to conduct the training on virology and other related area.	1. To raise the capability of the scientists performing the research work.
2. To organise the training in instrumentation for sophisticated instrument.	2. 3 To act as the national technical information center.
3. To arrange the seminar/ workshop for the scientists all over the country.	

Annex II Experts

1. Bioassay
2. Biotechnology[1)]
3. Immunochemistry
4. Immunology[2)]
5. Biochemistry
6. Radio-isotope technique
7. Animal Experiment Center
8. Biological products research
9. Microbiology
10. Research planning
11. Statistical analysis in Biomedical Research
12. Others[3)]

Note : 1) Biotechnology includes the following areas

- Genetic study in bacteriology and virology
- Study on production of viral vaccine, using genetic engineering
- Study on production of bioactive substances using genetic engineering.

2) - Cell mediated immunity
- Diseases related to immunological phenomenon

3) including the strengthening of activities of Regional Medical Sciences Centers.

Annex III List of the Articles

1. Equipment, reagents and expendable materials which are indispensable to carry out effective technical cooperation by the Japanese experts and difficult to purchase in Thailand.
2. Parts of the equipments provided by the Grant aid, if requested by the Japanese experts.
3. Machines and tools for repair work.
4. Guide manuals, books and documents.
5. Vehicles.
6. Other necessary equipments and materials.

Annex IV Fellowships

1. Bioassay
2. Biotechnology[1)]
3. Immunochemistry
4. Immunology[2)]
5. Biochemistry
6. Radio-isotope technique
7. Animal Experiment Center
8. Research on new biological products
9. Others[3)]

Note: 1) Biotechnology includes the following areas

- Genetic study in bacteriology and virology
- Study on production of viral vaccine, using genetic engineering
- Study on production of bioactive substances using genetic engineering.

2) - Cell mediated immunity
- Diseases related to immunological phenomenon

3) including the strengthening of activities of Regional Medical Sciences Centers.

Annex V List of Thai counterpart and administrative personels

Director General DMS

Deputy Director General DMS

Director, NIH

Deputy Directors, NIH

Principal Scientist

Director, Virus Research Institute (VRI)

Director, Division of Clinical Pathology (DCP)

Director, Division of Medical Entomology (DME)

Director, Division of Medicinal Plant (DMP)

Director, Division of Toxicology (DOT)

Director, Division of Food Analysis (DFA)

Director, Division of Drug Analysis (DDA)

Director, Secretary Office, DMS

Chairman of Radioisotope Board, DMS

Chief, Biological Product Control

Chief, Scientific Equipment Centre

Chief, Animal Experiment Centre

Annex VI List of Land, building and facilities

1. Department of Medical Sciences, Bangkok.

2. National Institute of Health, Nonthaburi.

3. Regional Medical Sciences Centers

   - Songkhla
   - Chon Buri
   - Nakhon Ratchasima
   - Khon Kaen
   - Chiang Mai
   - Phitsanulok

第 8 章

参 考 事 項

8.1. 医科学局の研究者像

技術協力の行なわれるＮＩＨの母体となる医科学局の研究者像を，各部を視察訪問した印象および，７回のウイルス学・免疫学のセミナーでの印象によって，概略を述べておきたい。

(1) 勤務時間：８時半～４時半。昼休みは，１２時～１時。土・日は休み。

４時半には，ほとんどの職員が帰宅し，それ以上残っているものは極めて希である。土，日は全く出勤しない。食事時間を大切にし，１２時には食堂または外食に出向く。

(2) どの部も女性が極めて多く，８割を占める。男性の医学部・獣医学部出身者は，病院等へ流れ，基礎研究所にはこない。これは日本の現状と規を一にしている。現在の医科学局長以下の主脳陣も，１人を除いて全て女性である。女性の中でも年令にかかわらず未婚者の率が高く，1/3 位はいると思われる。

(3) 階層制．上下関係，階級の差が日本より遥かに強い。部長（Director），室長（Chief Scientist，Senior Scientist），室員（Scientist）と区別されており，全て大学卒であり，その内 1/3 位は修士である。Scientist の下に Technician が配置されており，彼等は，医科学局付設の衛生検査技師学校（Health Science Quality Control）出身者である。更に，その下に Worker が配置されていて，雑役を行なう。他に，各部に自動車運転手．３名位の秘書・タイピストが配されている。秘書等が多い事により，事務処理能力は極めて高く，ほとんどのタイプは数時間以内に完成する。上位研究者は，実験より desk work が多い。

Scientist は，日本，欧米諸国への短期・長期の留学・出張が極めて多く，片言の日本語や巧みな英語を話す。

(4) 機器の報告で述べる如く，機器の数量は極めて多いが，同種の機器のダブリングが多い。これは，後述の縦割りの強さの故である。大半の機器は，今までの日本との技術協力により供与されたもので，一部アメリカ，西独からの供与品がある。自力購入品は，極めて少ない。

(5) 研究のレベル。各部とも基礎的な検査能力は十分である。しかしながら，検査データをまとめ上げて研究をおしすすめたり，そのまとめ上げたデータから，結論を導びく習慣にやや欠ける所がある。その意味で，研究計画の立て方や，データをまとめ上げる指導が望まれている。医科学局内では，薬学関係がアクティビィティが高く，感染症関係が相対的にではあるが，やや低い印象がある。

分野としてみた場合，生化学一般の知識・技術が低い。これは，タイ国一般に言える様である。従って生化学分野で多用されるＲＩの技術も，ほとんど未経験である。この方面の知識および技術導入の重要性がある。

(6) 縦割り。いかなる国の，いかなる制度にも，縦割りの問題はあると思われるが．タイではそれが著るしい。隣りの部屋の機器と同一の機器を，自分の所でも要求し所有する。他の部

の機器を使いに行かず，また部間の情報交換も行なわれていない。他の研究所や大学との交流もやや弱い。もっと積極的な知識交換，情報交換，技術交換が望まれる所である。

(7) 自発性。自から求め，自から考え工夫していくという自発性に欠けるきらいがある。日本や欧米の研究者に指導してもらうのを当てにする依頼性が見られる。

セミナーは，ウイルス学・免疫学を中心に7回行なった。部局外からの参加者も数名あったが，主に医科学局のウイルス研究所と臨床病理部からであった。セミナーの内容は付表の通りである。前述の印象に加えて，セミナーでは，次の様な印象を得た。

(1) 新しい技術に対して，名称位の知識はあるが，全く未経験である。7回のセミナーの中でも，第1回のＥＬＩＳＡの基礎技術以外は経験がない。また，一般的な生化学の基礎知識，とりわけ核酸の知識が乏しい様に思われた。

(2) 新しい技術に対する関心は高く，興味を抱き，自ら試みようとする意欲はあった。別刷請求や，文献を知りたいという希望が出た。また，新技術を自分の研究に応用したいという質問も出，積極性も見られた。特に，比較的若い研究者は，積極的で良き指導者さえ得られれば，伸びる可能性は十分に高いと期待される。

研究者の資質を高める為に，タイ国でも提案してきたが，以下の三点が工夫されると良いであろう。

(1) 機器の中央化。

(2) 新着雑誌の抄読会，専門書，技術書の輪読会。

(3) 自分の研究発表・討議の機会を持つ。医科学局・ＮＩＨ全体で．各部持ちまわりのコンファレンスを月1回，各部内で週1回位の回数が妥当であろう。

付：セミナーの内容

1. ＥＬＩＳＡとその抗体Avidity測定への応用（Stringent ELISA）
2. Radio immuno precipitation とPAGE
3. モノクローナル抗体の作成
4. ウイルスＲＮＡの塩基組成と，感染性ＲＮＡ調整
5. オリゴヌクレオチド・フィンガープリント法
6. ウイルス蛋白質のアミノ酸組成
7. ウイルスの動物に対する向神経性の実験病理

（加藤茂孝）

8.2. タイ国における生活ガイド

今後，専門家が滞在するに当って，タイ国での生活習慣・風俗の予備知識の一助となる様に，簡単にタイ国とりわけバンコック市の生活の様子を記載しておきたい。

(1) 交　　通

交通手段は，車しかない。国電，私鉄，地下鉄，モノレール等は一切なく，全て車に頼らざるを得ない。従って，交通渋滞はすさまじく，特に朝7～9時，夕刻5～7時は，車の洪水で大渋滞の際には，1時間で3kmとか，全く動けない事も起り得る。この時間帯以外には昼（12～1時）以外は，比較的スムーズに走れる。

専門家の場合，NIHに供与された車を使用できるはずで，運転手についてはタイ厚生省の運転手か，又は自分で雇う事になる。自分で雇用する場合，月3万円位と思われる。英語の多少理解できる運転手の場合，若干高くなるが人件費は極めて安い。

国際免許証を持参したとしても，自から運転するのは望ましくない。その理由として車の混雑と乱暴な運転，様々な車種の混在走行，車検制度や強制保険制度もなく，任意保険も金額が低い。事故率は極めて高く，公式統計のみによれば，人口当り，世界第一位である。さらに，昨年4月（1984年）より，主要道路が一方通行に改ためられ，よほど道路事情に精通しないと，自分では目的地に到達できない。

自家用車以外には，公共バスが約100路線に頻繁に走っており，バスのみは一方通行規制がないので，時としては自家用車より早く目的地に到達できる。バス路線には，番号がつけられており，英語Mapでこの番号をしらべて利用すれば，ほとんどどの方面にも行くことが可能である。運賃は極めて安く15円で，全区間乗りうる。冷房つきのバスが約10路線あり，50円である。日本国内のバスの如く，車内放送がないので，下車する場合は前もって位置を知っておかないと，下車バス停がわからない。ブザーで下車を予告する事が可能である。

自家用車・公共バス以外の交通手段として，タクシー，オート三輪タクシー（サムロという）がある。いずれも乗るに先立ち目的地を言い，次で運賃を交渉し，合意に達すれば乗車できる段取りとなる。タクシーの運転手は，片言の英語が通じる。ホテルでやとうタクシーは割高で，流しのタクシーの2倍以上の値段であるが，車がよく，運転も大人しい。サムロはその構造上，やや不安定で転倒した際の身体の防禦の点で，不安が大きいが，流しのタクシーよりやや安い。

歩行については，特に注意を要する。即ち，慣例的に自動車絶対優先なので，車がきたら絶対に止ること。横断歩道上でも同様である。歩行者優先の慣行はない。道路横断の際は，現地の人の横断を見習い，一緒にくっついて渡るのが安全である。

日中は暑いので，500m以上歩くのは大変な労働であり，それ以上の距離はまず歩行不可

能である。

(2) 食　　物

食料は豊かでかつ，廉価である。熱帯でかつ海岸を有する国なので，果物・野菜等の農作物と，エビ・魚等の海産物に特にめぐまれている。タイ料理の主食は米と米から作った麺である。味付けは中華風であるが，嗅いの強いパクチという野菜をほとんど全部に加えるので，その嗅いが入っている。料理によってはチリ（唐辛子）を加えるので，噛まない様に気をつけた方が安全である。米は，いわゆる外米（細長いインディカ種）で，調理の際に，ぬめりをすてるので，水気のぬけたパサパサの米飯になり，そのままでは極めてまずい。タイではその上に副食をかけ，まぜあわせて食べるのが一般的である。いわゆる炒飯の米は美味であり，日本人向けの味付けにもなっている。

果物類は，一年中入手可能で，特にパイナップル，パパイヤ，パメロ（大型のざぼんの様なみかん），スイカは常食可能である。

バンコック市内には，各種のレストランがあり，西洋料理，中華料理，日本料理も多く，食生活で不便を感じる事はない。

(3) 衛　生　状　態

感染症による死亡が死因の上位を占めており，衛生状態には十分注意を払う必要がある。飲料水は，「ポラリス」等，ビン詰めの水を利用し，水道水も飲用しない方が望ましい。バンコック市内の水道に関しては，医科学局食品分析部のデータによれば，微生物の混入や汚染物質はまずみとめられず，一応は保証されている。料理は，煮る，焼くなど火を通した物は安全と思われるが，生物は避ける方が良い。果物類も切って店頭で並べられているものは避けた方が良いであろう。

感染症は，熱帯地方に多く見られる，マラリヤ，デング熱，日本脳炎，急性下痢症等や，狂犬病，A型およびB型肝炎，破傷風，結核，肺炎がある。食品以外に，蚊，犬，外傷などに注意を払う必要がある。これらの疾病のうち，バンコク周辺で多いのは，狂犬病位であり，衛生環境には十分注意を払う必要はあるが，余り神経質にならなくともよい。しかし地方に長期に出張する際には，十分注意して地域によっては，マラリヤの予防薬を服用するなどの措置が必要となる。

犬は，くさりにつながれていず，飼犬，野犬とも全て放し飼いで，寺院，路地にはその頭数が極めて多く，異常行動の犬には近よらない様に十分注意すること。しかし，暑さのため犬も不活発で大抵は寝そべっているか，座っている位で，吠えたり，走ったりする犬は見うけられない。従って，異常行動の犬はみわけやすいと思われる。人をかんだ犬の約60％に，狂犬病ウイルスが検出されるので，かまれたら，狂犬病を疑い，必らず直ちに，狂犬病ワクチンを接種すること。

以上の如き，感染症が見られるので，専門家の訪タイに当っては，狂犬病ワクチンの接種（少なくとも2回），A型肝炎予防のためのγ－グロブリンの接種や，抗マラリヤ剤，各種抗生物質の持参が望まれる。

これら以外に，タイでは不明発熱がしばしば見られる。大病院の医師は英語が通じる。

(4) 気　候・温　度

熱帯地方なので日本から見れば，一年中夏である。しかし6月～10月に雨期があり，その雨期をはさんで，前をHot（3月～5月），後をCool（11月～2月）Seasonと称し，1年を3期にわけている。雨期は，夕刻頃に1時間ほど豪雨が降るが，それ以外の時間には雨は降らない。豪雨の雨量は大量で，元来低湿地であるバンコクは，排水施設の不備もあり，時として道路は冠水状態となる。

年間を通じての平均気温は27.6℃で，最高平均気温が32.5℃，最低平均気温が23.7℃である。また，年間の平均湿度は79％で，最高平均湿度が94％，最低平均湿度は60％である。詳しくは添付の各季節における温湿度を参考にされたい。実感する湿度は，数字よりも低い様に思われ，カラッと乾いていて，日本の梅雨や熱帯夜の様な蒸し暑さはない。日影は涼しく感じられるが，日向は冬でさえ暑く，直射日光の当る場所では40℃を越えるものと思われる。雨期以外には，雨はほとんど降らない。台風の様な，強い風は吹かず，微風が吹く程度である。南方のマレー半島では，モンスーンがあり，比較的強い風が吹く。地震はない。

(5) 服　　装

一年中夏なので，儀礼用に夏の正装が1着あれば十分で，他の時は一般的な夏の服装が自然である。くつも正規の服装以外の折は，サンダル様の通気性のよいくつの方が楽である。又、洗濯物は昼でも夜でも，数時間以内に乾くので，洗濯は極めて容易である。ホテルなどのランドリーも1日で出来上り安価である。

むしろ問題点は，冷房にあり。訪タイ直後は冷房病が要注意である。タイの冷房は常に，High－Coolにしてあり，外気との関係や人間の体温調節を無視しているが如き感があり，冷やしすぎと感じる事がしばしばある。外気は暑く中は寒く，体温調節機能が狂って，冷房病になりやすい。ことに日本の寒い季節に訪タイする折には，この点の注意が必要で，室内ではカーディガン等，長袖衣類を着用し，予防する事が肝要である。

(6) 買　　物

各地に朝市が立ち，食料品等は極めて廉価に入手できる。加工状態に注意を払い，衛生状態に疑問のあるものは，控えた方が望ましい。又，近代的なスーパーマーケットも多く有る。デパートも多く，日本資本のデパートも，大丸（2店），そごう，東急（建築中）とあり，買物に不便はない。価格は，輸入品は割高であるが，他は廉価である。デパートでさえも，英語は余り通じない。日系デパートも，店員は，ほとんどタイ人で，日本語は通じない。

(7) 治　　安

治安上不安はない。泥棒，殺人，すり等はあるが，日本と比べてやや多い程度にすぎないと思われる。むしろ，外国人，特に日本人は金持と思われているので，不必要に高い値をふっかけられて，後になってぼられたと思う事がしばしばある。一般の市民は，温好で親切であるが，外国人と接している人の中には，巧みに金を得ようとする傾向が見られ，早く生活になれる事により，適切な価格の判断をつける事が望まれる。金持ちの日本人に対して，小さな品物，たとえばボールペン等をねだられる事があるが，これは断っても一向に問題は起きない。

夜間の一人歩きも，地理をわきまえていれば問題はない。女性の一人歩きも特に危険ではない。

(8) 雇　　用

日本に比べて人件費は極めて安い。大学卒の初任給が6万円位といわれ，単純労働等は更に低い。お手伝いさんが，月に5千円～1万円（タイ語しか話せず，タイ料理しか出来ない場合）。日本語か英語が多少でき，日本料理ができる人で2万円位といわれている。運転手は前述の如く，2万5千円～3万円である。これらの雇用事情を反映して，レストラン，店舗等は，従業員が多い。長期に滞在する専門家の場合，運転手1人，お手伝さん1人を雇って，月4～5万円で可能である。

(9) 民情・生活習慣など

タイの国民性の特徴は，私見では大きく三つの要素に影響されている。第1が仏教，第2に国王，第3に暑さである。

仏教は，いわゆる小乗仏教で，戒律を主んじる教派である。国家仏教，国民仏教とでも言いうる如く重要視されていて，男子は一生に一度は僧侶の生活をする様になっていて，国王とても例外ではない。僧侶に対する国民の尊敬は極めて篤く，早朝の托鉢の折には，各戸で食事，花，お金等を喜捨し，建物，乗物の入口等で出会う折には合掌して迎える程である。病院も特別扱いで，僧侶専門の病院があるし，その専門病院の設立が不可能な所では，専門病棟か専門病室を作っている。国民同士の挨拶の場合にも，お互いに合掌しあう。この姿は傍から見ていると極めて美しく，感動的ですらある。普通，目下の方から額の所で合掌し，目上の方は胸の所で合掌して答礼する。同格の場合は，共に額の所で行なう。仏像に対する尊崇も篤く，各戸，各部屋には必らず仏像が安置されており，大学の近代的な研究室ですらこの例外ではない。医科学局の各研究室にも，仏像は置かれている。国民の祝日も，仏教および王室に関するものが多い。公式の13休日の内，それぞれ3日，5日を占め，残りの5日の内，年末年始以外は，両者との関連が深い。

国王は，1932年の憲法制定により，専制君主の座から離れ，日本に近い立憲君主制に変

っているが，国王および王室への尊崇もまた極めて篤く，仏教と国王が，二大尊崇対象になっており，先に述べた仏像と同じく，各戸，各室に王室の写真が必らず掲げられている。研究室でも，仏像よりもむしろ写真，肖像の方が目立つほどである。大学や研究所には，国王又は王族の名前がつけられているものが，これまた極めて多く，代表例としては，Chulalongkorn 大学，Mahidol 大学，Siriraj 病院，Ramathibodi 病院，Mongkut 工科大学，Saovabha 王妃記念研究所（タイ赤十字），Prince of Songkhla 大学等である。重要な事業には必らず王室が関与され，ＮＩＨの起工式，開所式にも王族の臨席が予定されている。

仏と国王という絶対崇拝の対象を二つも有する故か，国民の間には階級制度に対する受容性が極めて高く，地主・領主制度から興ったサクデナーという制度の精神的残存が見られるし，貧富の差，地位の差は，ほとんど階級のない日本から見ると，驚くほど大きい。下層の人々が努力して，中流化，上流化して行く日本と異なり，それぞれの層で，日常に満足している様に見うけられ，日々の生活が無事にすぎて行けば，それで満足という考えが強い様に見うけられる。「サバーイ」（心の平安，満足）を大切にする人々で，日々のサバーイに生きている風情がある。また，自由を愛し（Thai は，自由の意），他人に余り干渉せず，また干渉される事をきらう所がある。民族としての誇りも強く，こちらの意見を述べる場合にも，相手の意見をまず聞いてから，次に自分の意見を出す方が望ましい。これは，タイにのみ限った事ではないが。

日々の生活態度は，第３の要因の天候（暑さ）の影響を見のがせない。暑いので余り激しく働らくと，体力の消耗が激しく長つづきしない。従って，歩行等日常の動作は，ゆっくりしていて消耗を避ける様にしている。また，午后の暑い時間帯の戸外労働はしない。日本の様に，残業して夕方や夜まで働らく事はない。日本人でも，日本風に働らきつづけると体調をくずすので，タイ風に合わせた方が，長期的には長続きする。天候に恵まれ，常に農作物が出来るので，食料には不自由せず，ぜいたくさえしなければ，食生活は安泰である。衣料も夏物だけで年間すごせるし，夜具も無しか，薄物一枚で十分であり，衣食住についてあくせくする事がない。

こういった事情で，日々の生活が安泰であるので，生活・自然条件の厳しい日本から見ると，やや向上意欲が乏しいかの如く見うけられるが，これが国民性である。

仏教よりもっと日常化し，基層にある宗教意識として，ヒンズー教や，シャーマニズムの影響を受けたものがある。身体の致る所に神（ピー）が宿るという信仰もその一つで，身体に矢鱈に触るのは避ける事が大切である。特に，頭には重要な神が宿っているので，可愛い子供の頭をなでたいと思っても，頭の神が汚れるので，厳に粛しまなくてはならない。又，日常動作での失敗，たとえば皿を洗っている途中で手をすべらして皿を落して破った場合なども，本人の責任ではなく，手に宿る神のしわざであり，本人は責められても困惑するのみ

である。神の宿りは，日本からは既に失なわれた信仰・習慣であるので，失敗した当人を責めすぎない様，注意が必要であろう。

タイ人は，一般的に親切で心やさしい。特に，「微笑の国」と言われる如く，その笑顔は美しく心なごむ。地方では更に，それが美しい。

(10) 日本および日本人の立場

東南アジアでは，日本は経済大国であり，日本人は金持である。タイ国は発展途上国というよりは，先進国，少くとも先進国一歩手前である。しかしながら，GNP，個人所得で比べる限り，日本の値から遥かに離れている。タイ国には，日本企業，日本製品があふれており，Evergthing from Japanとさえ言われている。日本の経済力，日本の技術，日本人の優秀さに，尊敬と憧れを持ちながらも，余りにも日本が入りすぎてきている事に対して，複雑な感情を内部に秘めている事が感じられる。農作物買入れ問題などの貿易摩擦，日本デパートの進出等の折には，小さな反日デモがある。反日は，国民のごく一部の感情にすぎないと思われるが，前述の如き，Evergthing from Japanの構造がある限り，注意深くあらねばならない。訓練の行き届かないホテル等の従業員の一部から，あからさまに反日感情を示される事がたまにある。

技術協力については，全く日本の経済力，技術に頼り切っており，その点においては問題点はない。私見ではあるが，技術協力が思ったほど知られておらず，日本の無償供与や，協力の実態を広くアッピールする必要があると思われる。アッピールにより，対日感情も更に好転する期待がある。タイ国内のみならず，日本人向け，日本国内向けにも必要であろう。

（加藤茂孝）

表9－1　バンコックの気象

月	気温（℃）				湿度（％）				雨量（mm）			
	最高	最低	月平均		最高	最低	月平均		降雨日数	最高	最低	全雨量
			最高	最低			最高	最低				
1月	34.1	14.0	31.1	20.8	97	39	89.5	50.5	1	0.6		0.6
2月	34.6	19.5	33.0	24.4	95	41	89.3	52.8	1	12.9		12.9
3月	35.8	21.5	34.0	24.9	96	39	89.3	51.3	4	17.5	0.6	33.9
4月	37.0	23.8	35.2	26.8	97	43	89.7	53.1	5	22.8	0.5	52.8
5月	38.0	23.8	34.5	26.1	97	38	89.3	55.4	13	66.2	0.1	184.1
6月	34.5	23.4	32.5	25.7	98	52	89.1	60.8	20	71.2	0.1	130.9
7月	34.6	22.2	32.9	24.7	97	47	90.3	58.5	18	75.4	0.1	239.8
8月	34.5	23.4	32.8	25.8	96	50	86.8	58.0	21	23.6	0.1	93.1
9月	34.8	22.7	32.8	24.4	98	52	94.3	60.8	21	84.4	0.1	314.8
10月	33.8	21.0	32.0	23.8	98	36	93.1	59.0	14	87.9	1.1	309.3
11月	34.6	19.4	32.5	23.3	95	42	88.8	53.0	5	9.4	0.5	25.8
12月	34.0	18.6	32.1	21.5	96	42	86.3	48.5	0	0	0	0

雨量10月下旬激減．4月下旬より漸増。

資料1－1　N I H各部要望機材（1984－12月）

Item	Description	Amount	Item	Description	Amount	Item	Description	Amount
1	Electrophoresis apparatus	1	16	Colony Analyzer System	1	29	Tissue homogenizer	1
2.	Deep freezer	1	17	Centrifichem Specific Proteins (Baker instrument)	1	30	Thermostatted cell compartment cell programmer and micro flow cell	1
3	CO_2 Incubator (temp. 30-60°C, 6 cu. ft.)	1	18	Humidity and temperature recording Zuzuki with 30 rolls of recording paper	3	31	Stomacher (Colworth	1
4	CO_2 incubator (6.1 cu. ft.)	1	19	FHK-Light trap with 24 light tube	4	32	Refrigerator/Freezer, explosion proof 14 cuft.	1
5	Refrigerated centrifuge (20,000 rpm. with complete rotors and microplate rotor)	1	20	Insect pin with head No. 0, 1, 2	200 pk	33	FPD and NPD detectors	1
6	Ultrasonic cell disruptor (generator 200-300 water, 5-10 K, cooling jackets, titanium tip:~ standard size and microtip)	1	21	Headless insect pin No. 0, 1, a and pinning foam	200 pk	34	Micro Kjeldahl	1
7	Agarose gel electrophoresis	1	22	Printing machine for labelling scientific names	1	35	Fluorometric detector	1
8.	Automatic multipoint inocculator	1	23	Humidifier with automatic control	4	36	Peak integrator	2
9	Multiautodrop (10-300 l dispensing volume)	1	24	Instrument for rapid analysis of BOD, COD, DS and Oxygen consumed	1	37	Syringe pump "Trible channel" for infusion only	1
10	Refrigerated centrifuge (20,000 rpm. 50 mlx 8 glass tubes, angle head with 3 sets of spare tubes	1	25	Automatic CO_2 incubator	1	38	Nephelometer	1
11	Automatic agar dispenser	1	26	Water aspirator and cooling bath (Eyela Labo Instrument A25,CA-101)	1	39	Vacuum oven	1
12	Automatic dispenser in spotting phage	1	27	Water bath for evaporator (Eyela SB-35) with 200x200mm lab jack		40	Ultrasonic cleaner	1
13	N_2-O_2-GO_2 incubator Esper Co. model LNP 120:box 10x81 cm	1	28	Freeze Dryer, mechanically refrigerated, condensate capacity 5 litres. Temp-100°to +120° in 5°C increments with portable precision direct drive pump	1	41	Wrisk-action shaker	1
14	Auto dispenser (Spec No.362)	1						
15	Filtering apparatus (spec. No.352)	1						

資料1　機　材　関　係

資料1－1　ＮＩＨ各部要望機材（1984－12月）

資料1－2　医科学局現有機材（1984－12月）

資料1－3　地域医科学センター機材

資料1－4　無償供与予定機材

資料1－5　試　　薬

資料1－6　消　耗　品

資料1－1　ＮＩＨ各部要望機材（1984－12月）　（続き）

Item	Description	Amount	Item	Description	Amount
42	Coulter counter for leukocyte counting in Pertussis vaccine	1	55	Culture stirrers, shakers and agitators	1
43	Electric boiler	1	56	Refrigerator 4°C, 2 door	1
44	Electric hand dryer	1	57	Up-right freezer (-20°C)	1
45	Movable table	1	58	Small water bath	1
46	Electric pump and sprayer	1	59	Automatic safety pipette	1
47	Animal board		60	Loop microincinerator (Gass heated)	1
	for rat: hardwood with metal hook in each corner, over all dimension 380x250x75mm.	6 sets	61	Electric autoclave up-right type	1
	for rabbit: anodized aluminum with adjustable head holder, working surface 75mm. above table, dimension 200x385mm.	6 sets	62	Multichannel Analyzer (Well type)	1
48	Wound clip, stainless steel		63	Radiochromatograph scanner	1
49	Metabolic cage of transparent polycarbonate and polymethyl-pentene with cage accessories:- filter cover, water bottle, card holder and cage racks.	24sets	64	Dose calibrator	1
50	Statham Transducer ±30g, ±0.6mm. input 7.5V. max.	1	65	Electrophoresis system	1
51	Inhalation chamber	1	66	Refrigerated centrifuge (10,000 rpm.)	1
52	Table top centrifuge	1	67	Fraction collector system	1
53	Homogenizer	1	68	Freeze dryer	1
54	Tissue grinder	1	69	Refrigerator	1
			70	Water bath, temp. control	1
			71	Tissue sample homogenizer	1
			72	Vedeo camera	1
			73	Vehicle	3

資 料 1－2

List of Equipments in DMS at December 1984

(A) Equipments in more than two division

	Name of equipment	DIVISION									
		ME	CP	TX	DA	FA	MP	BP	VR	SI	Total
A	Autoclave	2	4	1	1			2	12		22
	Atomic absorption			1	1	2					4
B	Balance – two-pan & swing				9	1	3				13
	Balance – analytical	2	3	6	13	9	6	1	3		43
	Balance – electrical				4	3		1	2		10
	Blendor (waring & labo.)					3	2				5
C	Centrifuge – common		8	2	5	2	5	1	6		29
	Centrifuge – refrigerated							1	6		7
	Centrifuge – ultra-								2+1*		2+1*
	Chromatography – affinity								1		1
	Chromatography – HPLC				2	2			1		5
	Chromatography – gas			1	2+1*	10	1				14+1*
	Chromatography – thin layer				1	1					>2
	CO_2 incubator		2					1	3		6
	Computer (logic analysis & caliculator)						1		1	1	3
	Coloney counter			1			1				2
D	Deep freezer – -280°C		1+2*		1	1			16		19+2*
	Deep freezer – <-30°C							1	7+1*		8+1*
	Demineralizer							1	2		3
	Distiller				1			3	1		5
E	Electrophoresis				1				1		2
	Evaporator (with heater)			2	5	6	7				20

List of Equipments in DMS at December 1984

(A) Equipments in more than two division

	Name of equipment	DIVISION									
		ME	CP	TX	DA	FA	MP	BP	VR	SI	Total
F	Fraction collector						3+1※		1		4+1※
H	Homogenizer				2	2	1				5
	Hood — chemical			6	27	19	9				61
	Hood — Sterile		4						6		10
	Hot plate (with stirrer)	1	3		14		6				24
I	Ice maker				1		1		1※		2+1※
	Incubator		13+2※	1	2	4		2	10		32+2※
L	Lamina flow				2			3			5
	Light box						1	1			2
	Lyophilizer		1				1+1※	1	2+3※		5+4※
M	Melting point			1	3		1				5
	Mercury Analyser			1		1					2
	Microscope — electron								1+1※		1+1※
	Microscope — fluorescent		2						3		5
	Microscope — light	3	8+1※	1	6	1	6	1	3		29+1※
	Microscope — upside-down							1	4		5
	Microtome						2				2
	Microtome — Knife sharpner		1				1				2
	Mixer — vortex				5						5
	Mixer — wet-dry					1	1				2
O	Oven (+vacuum oven, +Muffle furnace)	4	4	8	19	15	13	1	5		69

List of Equipments in DMS at December 1984

(A) Equipments in more than two division

	Name of equipment	DIVISION									
		ME	CP	TX	DA	FA	MP	BP	VR	SI	Total
P	pH meter		1	2	2		1	3	1		10
	Polarography				2	1					3
	Potentiography				4	2					6
	Power supply				1			1			2
	Projector (+overhead)				1				2		>3
R	Refractometer				1				1		2
	Refrigerator	7	17	5	12	13	12	2	30		98
	working								1		1
S	Safety cabinet				1	1					2
	Shaker	1		1	9	6	2				19
	Spectrophotometer regular				10	5	1	1	3		20
	double beam			1			2				3
	fluorescent				1						1
	infra-red						1				1
	luminescent					1					1
T	Titrimeter (automatic)			1	1						2
	Tahlet coating machine						1				1
	disintegrator				5		1				6
	making machine						1				1
	polisher						1				1
	weighing machine				1						1

List of Equipments in DMS at December 1984

(A) Equipments in more than two division

	Name of equipment	DIVISION									
		ME	CP	TX	DA	FA	MP	BP	VR	SI	Total
U	Ultrasonic cleaner			1	2				1		4
	UV-lamp (+observer)				5	2	2				9
V	Vacuum pump				2			1	1		4
W	Water bath		7	6	14	7	11	2	4		51

(B) Equipments in only one division.

(1) ME

Particle size microme	1

(2) CP

Disc cutter	1
Multi-inoculator	1
Paraffin dispensers	2

(3) TX

Mercury lamp	1
Pipetting machine (automatic)	1

(4) DA

Cooling circulator	1
Diluter	1
Dissolution test station	1
γ-counter	1
Glove box	1
Liquid scintillation counter	1
Media warmer	1
Nephelometer	1
NMR	1*
Printing machine	1
Polarimeter	1
Recopu	2
Recorder	1
Saccharometer	1
Spotter	1
Stabilizer	4
Thin layer maker	1
Zone reader	1

(5) FA

Battery charging unit	1
Dispenser	1
Humidifier	1
Kjeldahl apparatus	4
Rolled tube system	1
Thin layer chromatogram densitometer	1

(6) MP

Amplifier	1
Animal activity measure	1
Aspirator (electrical)	5
Blood pressure recorder	1
Cage (rabbit)	52
Capsule filler	1
Digital reader	1
Dryer	3
E E G	1
Escape for rat	2
Film dryer	1
Flame photometer	1
Granulator	1
Grinder	6
Heat-beat measure	1
Kymograph	3
Magnifier	1
Manometer	1
Mantle heater	14
Polygraph	2
Respirator	3
Stimulator	1
Thermometer	1
Timer	1
Tinware press	1
Tissue embedding center	1
Transducer	1
Turbidimeter	2
Uvicord	1
Water-pump	1
Weighing machine	8

(7) BP

Liquid N_2 Vessel	1

(8) VR

Autoprinter	1
Cold plate	1
Cryostat	1
Density gradient maker	1
Electron microscopy shadow casting	2
Ultratome	1
Enlarger	1
Magnetic stirrer	7
Millipore filter	1
Pippette dryer	1
Vial capping machine	1

(9) SI

Electrical drill	1
Electronics training kit	2
Micro-lathe	1
Micro-saw	1
Oscilloscope	2
Solding station	4
Tester	1

Abbreviations :

(Division)
- ME : Medical Entomology
- CP : Clinical Pathology
- TX : Toxicology
- DA : Drug Analysis
- FA : Food Analysis
- MP : Medicinal Plant
- BP : Biological Product
- VR : Virus Research Institute
- SI : Scientific Instrument Center

※ : out of order, or to be repair.

Notice

(1) There may be left out of inspection.

(2) Division of clinical pathology doesn't include the equipments in biochemistry section.

資 料 1－3

List of equipments in Regional Medical Science Center at December 1984

	Equipment	ChonBuri	Nakohn Ratcha-sima	Chieng Mai	Songkhla	Total
A	air-pump				1	1
	anaerobic culture box	3		1		4
	aqua tester		1		1	2
	autoclave	3	3	3	2	11
B	balance two-pan+swing	2	4	2	3	11
	balance analytical	1				1
	balance electrical	1	2	2	2	7
	bilirubinometer				1	1
	blendor (waring+labo.)		1	3	2	6
C	caliculator				1	1
	centrifuge	7	6	4	7	24
	coloney counter		1		1	2
D	deep freezer (-20°C)	1				1
	densitometer (protein)	1				1
	distiller		1			1
E	electrophoresis (serum)	1				1
F	flame photometer	1	1	1		3
G	γ-counter	1				1
	GCA/procession scientific				1	1
	glucose analyser	1				1
H	hood (chemical)	1	1	12	3	17
	hot plate		2	7	6	15
I	incubator	7	3		2	12
M	melting point		1	1	1	3
	mercury analyser				1	1
	microscope light	9		3	8	20
	microscope UV	1	1	1	1	4
	microtester		1			1
	Mixer (Vortex+stomacher)	2	1	1	3	7

	Equipment	ChonBuri	Nakohn Ratcha-sima	Chieng Mai	Songkhla	Total
O	oven (+Muffle furnace)	3	5	6	3	17
P	pH meter	1	3	1	1	6
	plaque counter			1		1
	polarimeter			1		1
	potentiograph				1	1
	power supply		2(small)			2
R	refractometer				1	1
	refrigerator	13	9	6	11	39
	rotator				1	1
S	Sedimentation pippette			1		1
	Shaker (+pippette shaker)	1	1	1	2	5
	spectrophotometer	2	4	3	4	13
	fluorescent		1	1	1	3
T	tablet disintegrator		1		1	2
	turbidimeter		1	1	1	3
U	UV lamp (+observer)		1	2	1	4
V	vacuum pump			1	1	2
W	water bath	8	2	5	5	20

Notice : No. of equipment of ChonBuri are including that of ChonBuri Hospital about 50%

EQUIPMENT LIST OF EACH DIVISION

(to be provided by Grant Aid)

Name of Equipment	VI	PA	DE	MY	BA	IM	ME	MP	EN	BF	PH	SE	RI	AE	S	AD	Total
(1) Analytical Equipment																	
1-1) Spectrophotometer																	
A) Atomic-absorption Spectrophotometer												1					1
D) Double beam Spectrophotometer											1						1
Double wave length Spectrophotometer												1					1
I) Infra-red Spectrophotometer												1					1
M) Micro-plate Spectrophotometer						1											1
Microtiter set						6											6
U) UV-VIS Spectrophotometer					1	3		1									5
1-2) Chromatograph																	
C) Colum Chromatograph	1				3	2											6
-fraction collector	1				3	2						1					7
-UV monitor						2											2
-chromatograph chamber						1											1
G) Gas Chromatograph					(1)					(1)		2(2) (5)					4(5)
H) H.P.L. Chromatograph (A)												1					1
- do - (B)											1	1					2
T) T.L. Chromatograph											1						1
-digital densitometer												1					1
1-3) State Analysis																	
N) NMR(Nuclear Magnetic Resonance)												1					1

Name of Equipment	V I	P A	D E	M Y	B A	I M	M E	M P	E N	B F	P H	S E	R I	A E	S	A D	Total
(2) Animal Experimental Equipment																	
2-1) Breeding Shelf & Cage																	
B) Breeding Shelf (for m/r/g)														36			36
- do - (for rabbit)														17			17
C) Cage (for mouse)														400			400
- do - (for rat)														400			400
- do - (for gunea pig)														25			25
- do - (for rabbit)														320			320
- do - (for monkey)														10			10
F) Food Container set														1			1
Feeding Box														1000			1000
Water Bottle set														1000			1000
2-2) Experimental Equipment																	
A) Animal Balance (for m/r)														12			12
- do - (for rabbit)														10			10
- do - (M size)														2			2
K) Kymograph														2			2
M) Myograph														1			1
Microtome(sliding)														1			1
- do - (rotary)														1			1
O) Organ Bath														1			1
P) Pyrogen Test App.														2			2
R) Rabbit Fixer(pyrogen test)														3			3
H) Histopathological Equipment								(1)						1			1
2-3) Operating Equipment																	
M) Monkey Chair														1			1
O) Operating Table (S size)														2			2
- do - (M size)														1			1
Operating Light														3			3
2-4) Special Equipment																	
C) Clean Rack System (for r/m)														5			5
I) Infection Breeding set (for r/m)														4			4
V) Vinyl Isolator														6			6
Vinyl Isolator Compressor														2			2
Vinyl Isolator Autoclave														1			1

Name of Equipment	V I	P A	D E	M Y	B A	I M	M E	M P	E N	B F	P H	S E	R I	A E	S	A D	Total
(3) Biohazard & Safety Cabinet																	
3-1) B) Biohazard Cabinet (II B)														2			2
C) Clean Bench			6	1	4	3	1										15
S) Safety Cabinet	14	2		1	5			1	1	1	2			1			28
P) Pass Box												1		1			2
(4) Centrifuge																	
4-1 C) Centrifuge (low speed)	2	1		1		3		1	1		2	1		1			13
H) Hematocrit (12000rpm)								1						1			2
High Speed (20000rpm)					1	3			1			1					6
R) Refrigerated (5000rpm)					1	1						1					3
U) Ultra High Speed (55000rpm)												1					1
(5) Electrophoresis App.																	
5-1) E) Electrophoresis App.																	
(Cellose Acetate)			1			1											2
(PAGE)						2											2
(NA)						1											1
(Immuno Aga)						1											1
(6) Food Equipment																	
6-1) C) Cooking Utencils set										1							1
6-2) F) Food Cutter										1							1
(7) General Laboratory Equipment																	
7-1) A) Auto Blood Cell Counter			1														1
Auto Dispenser						5											5
-pipette set (micro)						8											
7-2) B) Blender (waring type)									2	2	1						5
Grinding Machine								1									1
Homogenizer	1																1
Mills Machine (Wiley type)										1							1
Mixer (magnetic stirrer)				1		3			1								5
Rotating Shaker (horizontal)		1															1
Separatory Shaker						1			2	1							4
Tube Mixer											1	1					2

Name of Equipment	V I	P A	D E	M Y	B A	I M	M E	M P	E N	B F	P H	S E	R I	A E	S	A D	Total
7-3) D) Desiccator	1																1
7-4) F) Filtering Device	1					2											3
(pressure) 1000mlit.																	
7-5) H) Hot Air Oven(60x50x50cm)			2							1	1		1				5
- do - (45x40x40cm)						1	1	1	1		2	1					7
Hot Plate					1				4	1							6
Oven (drying/desk top)						1											1
Muffle Furnace									1	1							2
Humidifier							1										1
7-6) Incubator																	
I) Co2 Incubator	2			1		2											5
Cell Culture Rotating						1											1
Dry Bath Incubator													1				1
Incubator(45x40x40cm)							1	1									2
- do - (60x50x50cm)			1			2				1	1			1			6
- do - (low temp)				2	1						1			1			5
- do - (water bath)			1								1						2
- do - (walk-in/+35deg.c)			1														1
- do - (+25deg.c)			1														1
7-7) K) Kjeldahl App.			1														1
7-8) P) Peristalsis Pump						5											5
PH Meter	1		2			2		1		1		1	1				9
Potensiometer										1							1
7-9) R) Rotary Evaporator								1	1	2	1						5
-cooling aspirator										1	1						2
7-10) T)Temparature Hygrometer Recorder							1							35			36
7-11) U)UV Lamp									1	1							2
UV Cabinet								1									1
7-12) W)Water Bath with shaker		1			2	4			3	1	1	1	1				14
Water Refiner(central)												1			6		7
7-13) Z)Zone Reader											1						1

Name of Equipment	V I	P A	D E	M Y	B A	I M	M E	M P	E N	B F	P H	S E	R I	A E	S	A D	Total
(8) Microscope																	
8-1) Electron Microscope																	
E) Electron Microscope																	
(Transmission)												1					1
(Scanning)												1					1
-critical point dryer												1					1
8-2) Microscope																	
M) Microscope																	
(Fluorescence)	1				1												2
(Inverted)	2				1	2											5
(Binocular)		1		1				2	2								6
(Research)				1		2								1			4
(Trinocular)				2		1											3
-micro-photographic app.	3			1	1												5
-stereo microscope		1					1										2
P) Plastic Slide Box							50										50
S) Slid Tray Cabinet							1	1	1								3
(9) Photography																	
Air Dryer (print dryer)												1					1
Dark Room Acc. set												2					2
Enlarger												2					2
Organ Photographic Stand												1					1
Slide Making Machine(photographic)												1					1
(10) Refrigerator & Cooling App.																	
10-1) D) Deep Freezer (-40deg.c/230lit)						1											1
- do - (-80deg.c/190lit)	1				1	2			1				1				6
Dry Ice Maker												1					1
10-2) F) Freezer (-30deg.c/270lit)									2	2							4
Freeze Dryer (mini type)												1					1
I) Ice Machine (35kg/day)												1					1
10-3) P) Program Freeze System						1											1
10-4) R) Refrigerator (400lit)						3			2	1	4			1			11
- do - (260lit)			4			4	1	2				1		1			13

Name of Equipment	V I	P A	D E	M Y	B A	I M	M E	M P	E N	B F	P H	S E	R I	A E	S	A D	Total
(11) R.I.																	
11-1) F) Fume Hood													4				4
- do - (double side)							1						1				1
11-2) H) Hand Foot Cross Monitor													1				1
11-3) S) Survey Meter													1				1
(12) Sterilizing Equipment																	
A) Autoclave (big size/central)															1		1
- do - (A.E. center)														1			1
- do - (through type A.E.)														1			1
- do - (biohazard type)														1			1
- do - (for lab)	3	2			3	3	1	1			1						14
Aseptic Box (A)														20			20
- do - (B)														30			30
E) E.O.G. Sterilizer															1		1
H) Hot Air Sterilizer															1		1
K) "Koch" Sterilizer					1												1
U) Ultrasonic Cleaner												1					1
(desk top type)																	1
- do - (pipette)	1					5					1		1				8
U.V.Sterilizer															1		1

Name of Equipment	V I	P A	D E	M Y	B A	I M	M E	M P	E N	B F	P H	S E	R I	A E	S	A D	Total
(13) Weighing Scale																	
13-1) B) Balance (analytical/200g/0.1mg)		1				2		2	3	1	1	1	1				12
- do - (micro/20g/0.001mg)										1							1
- do - (top-pan)						8			1	2	1	1	1	1			15
- do - (counter)	2																2
Balance table								2	2	1	1	1	1				8
(14) Work Shop Equipment																	
C) Clamp Ammeter												2					2
Circuit Tester												6					6
D) Digital Multimeter												3					3
Drilling Machine												1					1
E) Electric Saw Machine												1					1
I) Iron Vice Clamp												1					1
L) Lathe												1					1
Low Power He-Ne Laser Generator												1					1
M) Metal Folding Machine												1					1
Monochrometer												1					1
P) Photomutiplier Tube												1					1
S) Spectrum Analyzer												1					1
Stabilized High Voltage Supplier												1					1
T) Tool set												6					6
W) Welding Machine												1					1
(15) Laboratory Furniture																	
C) Cabinet (centrifuge acc)												1					1
- do - (rotar & acc)												1					1
- do - (instrument)														1			1
F) Fume Hood (150cm wide)										3							3
- do - (120cm wide)			1			1	2	13	4		2						23
U) Utility Cart														9			9
W) Working Table (mobile)							3					3		17			23

Name of Equipment	V I	P A	D E	M Y	B A	I M	M E	M P	E N	B F	P H	S E	R I	A E	S	A D	Total
(16) Others																	
1) C.P.U. System												1					1
2) Vehicle (van type)																1	1
3) Audio Visual Equipment																	
Movie Projector (16mm)																1	1
Slide Projector																3	3
Sound System																1	1
Video System (V.H.S.)																1	1
4) Office Instrument																	
Copy Machine																2	2
Calculator (desk top)																4	4
Stencil Machine																2	2
Typewriter (electric)																7	7

Chemical substances and reagent

(Unavailable in Thailand)

Description		
1. Virology		
1. CN-Br activated sepharose 4 B	15 gmx6	
2. Hepatitis A antigen (Tissue culture preparation)	2 - 4 ml	
3. Hyper immune serum of rotavirus type I and II	3 ml each	
4. Varicella Zoster seed virus (Tissue culture)	2 ml x2	
5. HELF for V-Z virus	1 bottle	
6. Parainfluenaza seed virus type 1, 2, 3, 4,	2 ml each	
7. Adenovirus 1, 2, 3, 4, 7, 8 (seed virus)	2 ml each	
8. Herpes simplex viruses type 1 and 2 (seed virus)	2 ml each	
9. Herpes simplex viruses hyper immune serum type 1 and 2	2 ml each	
10. Evanblue	1 bottle	
11. Sodium Azide Na N_3 (Iwai kagaku, Japan)	25 gmx12	
12. Sodium Metaperiodate Na IO_4 (Hayashi pure chemical industries Ltd., Osaka, Japan)	25 g x 3	
13. Seamless cellulose tubing for dialysis size 8/32 (Visking Company, Japan)	12 rolls	

Description	
2. Bacteriology	
1. Antilabile toxin of E. coli or Anti-Cholera toxin	5 ml
2. O and K antisera of Vibrio parahaemolyticus	2 sets
(Polyvalent and monovalent)	ea.
3. 2,4-diamino-6,7-diisopropyl pteridine (0129)	
10 μg/disc	500 discs
150 μg/disc	500 discs
4. API 20 E for Enterobacteriaceae and Vibrionaceae	300 sets
5. FITC labelled rabbit globulin of	
Ligionella pneumophila group 1-4	1 set
FITC labelled rabbit globulin of	
L. pneumophila group 1-6	2 ml ea.
FITC labelled rabbit globulin of	
L. micdadei, L. longbeachae, L. bez manii	2 ml ea.
L. dumoffii and L. gormannii	
6. ELISA test or RPHA test for detection of Staphyllococcus	1 set
enterotoxin	
3. Mycology	
1. API 20 C for identification of Candida spp.	300 sets
2. API 50 CM for yeast indentification	300 sets
4. Parasitology	
1. Human serum group AB	500 ml

Description		
5. Medicinal Plant research		
1. Standard amino acids		
2. Standard sugar		
3. Standard monoterpenes and sesquiterpene		
4. Deutero chloroform		
5. Hexadenterodimethylsulfoxide		
6. Tetradeuteromethanol		
7. Deuterium oxide		
8. Trimethylphosphine		
9. Diazald (N-methyl-N-nitroso-p-toluene sulfonamide)		
10. Celite, analytical filter aid		
11. Standard quinine, quinidine, cinchonine, cinchonidine		
12. Standard berberine		
13. Standard pyrrolizidine alkaloids		
14. Anesthetic ether		
15. Reagent for TLC		
15.1 P-anisidine		
15.2 Platinic chloride		
15.3 Tetrazolium blue chloride		
16. HPLC reagent grade		
16.1 Tetrahydrofuran		
16.2 2,2,4-Trimethylpentane		

Description	
6. <u>Biomedical Research on Food</u>	
1. Methanol (HPLC grade)	12 x 2.5 L
2. Acetonitrile (HPLC grade)	6 x 2.5 L
3. THF (HPLC grade)	3 x 2.5 L
4. PIC A (Tetrabutyl ammonium phosphate)	6 x 5 bottles
5. PIC B (Heptane sulfonic acid)	3 x 5 bottles
6. Cadmium powder	
7. <u>Enviromental Health Sciences</u>	
1. Toxin standards	50 mg ea.
- Aflatoxins B.G. each, Ochratoxin	
- Trichothecenes (1-2, NV, Fx, DAS etc.)	
2. Detergent standards	
- (ABS) Alkyl benzene sulfonate	500 g
- (LBS) Linear alkyl benzene sulfonate	500 g
3. Pesticide standards	50 mg ea
- Organophosphates (Mt.Parathion, Et.Parathion, Mt.Gusathion, Et.Gusathion, Paraoxon, Phosdrin, Mipafox)	
- Organochlorins (Aldrin, P,P-DDT, DDVP, Dieldrin, Endrin, Heptachlor, Heptachlor epoxide, Lindane, BHC-alpha isomer, Methoxychlor, p,p-DDD, O,P-DDD, O,P-DDE, DDT, P,P-DDE, O,P-DDT	
- Carbamates (Baygon, Methomyl)	
- Pyrethrins, Pyrethroids and their synergists (Pyrethrin, Piperonyl butoxide)	
- Herbicides (Paraquat, 2,4-D, 2,4,5-T, Rotenone)	

Description		
8. Pharmaceutical Sciences		
1. Pentane sulphonic acid sodium salt		
2. Octane sulphonic acid sodium salt		
3. Tetrabutylammonium phosphate		
4. PIC A and PIC B		
5. Bis-trimethylsiloxane		
6. Platinic chloride		
7. Albumin		
8. Acetylcholine		
9. Calcium thromboplastin		
10. Dibenzyline		
11. Limulus Amebocyte Lysate (LAL) single vials set	200 sets	
12. Muller Hinton Medium		
13. Brain Heart Infusion		
14. Brain Heart Infusion Agar		
15. Penicillinase concentrate 10,000,000 Units		

Description	
9. <u>Radioisotope Laboratory</u>	
1. ^{3}H - hypoxanthine	
2. Radioactive Cabelled 4-(3',4' dimethoxyphenylbut-3-en--1-Ol)	
3. ^{125}I labelled cannabinoid	
4. ^{14}C labelled pesticide (Benomyl, Cabaryl)	
5. ^{3}H - Depo medroxy progesterone acetate (DMPA) tracer	
6. ^{125}I - digoxin	
7. Digoxin antiserum (Welcome)	
8. DMPA antiserum	
9. Bovine serum albumin	
10. Diethylstilbestrol	
11. ^{125}I (OAEP)	
12. ^{32}P (Orthophosphate) (OAEP)	
13. ^{3}H - ATP	
14. ^{3}H - Thimidine	
15. ^{3}H - Uridine	
16. ^{3}H - Leucine	
17. ^{3}H - Tyrosine	
18. ^{3}H - Valine	
19. ^{3}H - Glucosamine	
20. ^{35}S - Methionine	
21. Scintillant	
- Toluene	24 x 1 L
- Liquiflor	4 x 500 ml
- Dioxane	18 x 1 L

Description		
Triton X - 100	3 x 1 L	
22. Activated charcoal		

Glassware and expendable materials

(Unavailable in Thailand)

Description	
1. Bacteriology	
1. Ampule for Lyophilization 2 ml	500
5 ml	500
2. Color-cap for test tube 13 x 100 mm (8 colours, autoclavable polypropylene)	2,500
2. Medicinal Plant research	
1. Oil determination apparatus with condenser, receiver and flask	2 sets
2. Distillation apparatus, short path semimicro	1 set
3. Micro-tubes (8 x 50 mm)	2 x 500
4. Spotting guide for TLC	2
5. Drying rack for TLC (for 10 plates)	5 sets
6. Plastic sheet, precoated for TLC silica gel with fluorescence indicator	
50 x 200 mm	10 pks
200 x 200 mm	5 "
7. Pipette 0.2 ml	6 doz
0.5 ml	6 doz
8. Syringe 0.25 ml (5/1,000 ml)	5 doz
0.5 ml (5/1,000 ml)	5 doz
9. Syringe, Hamilton for HPLC 10, 25, 100, 250 µl	3 ea.
10. Test tube with screw cap 16 x 120 mm	12 doz
11. Volumetric flask with solid glass stopper 1, 2, 5 ml	1 doz ea.

Description		
3. Biomedical Research on Food		
1. Sample filtration system	1 set	
2. Analytical column for GC		
2.1 Chromosorb W. HP 60 - 80 mesh	1 x 100 g	
80 - 100 mesh	1 x 100 g	
100 - 120 mesh	80 x 100 g	
2.2 Gaschrom Q 100 - 120 mesh	80 x 100 g	
2.3 Liquid phase : silicone SE 30, ov 17, ov 210, QF 1, DEGS	25 g ea.	
2.4 Selenide glass wool	1 x 100 g	
2.5 Teflon tubing $\frac{1}{8}$" for GC	50 ft	
2.6 Teflon tubing 0.2, 0.5 mm for HPLC	30 ft	
3. Guard column and resin	2	
4. Analytical Column for HPLC		
3.1 Reversed phase C_{18}	2	
3.2 Ion exchange (normal phase)	2	
3.3 Gel permeation (different size)	3	
5. Syringe		
4.1 microsyringe	2	
4.2 Gastight syringe	2	
6. Ferrules, Nuts and tubing for HPLC	1 set	
7. Blender jar (for explosion proved)	6	
8. Platinum dish and crucible	6 ea.	
9. Spectrophotometer cuvetts (silica)	4 pc.	

Description	
4. <u>Environmental Health Sciences</u>	
1. Glass columns for GC	12
(Length 6 ft. OD $\frac{1}{4}$", $\frac{1}{8}$")	
5. <u>Pharmaceutical Sciences</u>	
1. Dissection complete set	2
2. Dissection Boards & Pans for mice, rat, cock, cat, rabbit	2 each
3. Microdispenser	
- Eppendorf pipetter (1 - 100 µl)	4
(101 - 1000 µl)	4
- Eppendorf standard tips (1 - 100 µl)	3 x 1000
(101 - 1000 µl)	3 x 1000
4. Cornwall Pipette	
- Cornwall Pipetter 5 ml (complete set)	2 sets
- Cornwall Luer - Lok syringe 5 ml	2 sets
5. Distilling apparatus complete set	2
6. <u>Radioisotope Laboratory</u>	
1. Scintillation vials, Kimble	3 x 1000
(for β counter) Capacily 20 ml	
2. Test tube flat bottom, 1 x 6 cm	4 x 1000
(for β, γ counter)	
3. Stainless racks	
- For holding scintillation vials, item 1	20
(30 mm dia.)	
- For holding test tube flat bottom, item 2	20
(1.4 mm dia.)	

Description		
4. Eppendorf pipet, fixed model		
Capacity 50 µl	6	
100 µl	6	
200 µl	6	
500 µl	6	
1,000 µl	6	
5. Eppendorf pipet, three volume model (10-20-25 ul)	6	
6. Eppendorf stand	6	
7. Eppendorf standard tip		
size 1 - 100 µl	12 x 1000	
101 - 1000 µl	9 x 1000	
8. Eppendorf Repeater (Multipette)	5	
Volume setting 100 - 500 µl		
9. Eppendorf Repeater (Multipette), Stand	5	
10. Combitip for Eppendorf multipette		
Capacity 5 ml	4 pack	
1.25 ml	4 pack	
11. Accupenser Volume 10 ml	7	
(size of bottle 1000 ml)		
12. Test tube sterile with polypropylene screw cap		
Capacity 5 ml	1600	
Capacity 2 ml	1800	
13. Glass vial with plastic screw cap		
Capacity 4 ml	1000	
14. 96-flat bottom wells microtitre plate	150	

Description		
15. 200 µl - heparinized capillary	200	
16. Disposible Glove	10 pack (10 x 100)	

資料2　NIH Activity and Request

資料2.1.　ＮＩＨの構想

資料2.2.　ＮＩＨ研究課題

資料2.3.　動物実験センター計画

資料2.4.　医科学局各部の要望

資 料 2－1

Planned Activities of the NIH

There will be 11 main activities and 5 supportive activities (as shown in the organization chart). The main activities are:- Virology, Bacteriology, Mycology, Parasitology, Immunology, Biological Products, Medical Entomology, Medicinal Plants, Environmental Health Sciences, Biomedical Research in Food, Pharmaceutical Sciences.

The supportive activities are:- Administrative office, Animal Experiment Center, Biohazard laboratory, Radio-isotope laboratory and Scientific Instrument Center.

Programmes of each activities are as follows:-

VIROLOGY

Strengthening activities on diagnosis, survey and research in virus diseases, acting as reference center for other laboratories, consultation services and training. Virology laboratory also serves as WHO National Influenza Center and National Center for Viral Hepatitis.

The new programmes developed in the NIH are

1. Surveillance and research on chlamydial, rickettsial diseases.

2. Research on oncogenic viruses (Epstein-Barr virus, cytomegalovirus etc.).

3. Research to support the national epidemiological programme of Ministry of Public Health and to provide informations for prevention, control and treatment of viral diseases such as viral hepatitis, viral diarrhoea, acute respiratory viral diseases, JE, DHF, haemorrhagic fever with renal syndrome and new infectious diseases suspected of virus etiology.

4. Studies on molecular virology including interferon, monoclonal antibody techniques for characterization of viruses such as dengue, polioviruses and Japanese encephalitis.

5. Research and development of viral vaccines such as tissue culture rabies vaccine, Hepatitis B vaccine, Tissue culture JE vaccine. Biotechnology for the development of other second generation vaccines will be studied.

6. Research and development for rapid techniques as well as production of viral diagnostic reagents to supply to other laboratories, regional and provincial diagnostic laboratories and laboratories in foreign countries.

7. Training and workshop for local scientists and also foreign scientists.

BACTERIOLOGY

1. Research on mycoplasma including diagnosis, epidermiological and serological surveys.

2. Epidemiological research on acute respiratory and gastrointestinal infections.

- To study the etiology and epidemiology.
- To study the evidence of antibiotic resistance of the etiologic agents.
- Development of new and rapid technique for diagnosis.

3. Production of new diagnostic reagents such as coagglutination reagent for identification of beta-hemolytic streptococcus.

4. Study of miscellaneous bacteria which cause optimistic infection.

- To serve as reference and research laboratory for miscellaneous bacteria including anaerobes.

5. To develop new method of classification of bacteria by DNA-base composition, DNA-DNA or DNA-RNA hybridization, fatty acid composition and cell wall composition.

6. Study on the physiological characteristics of pathogenic bacteria.

7. Study on toxin production.

8. Study on molecular genetics of bacteria. Plasmid characterization in some pathogenic bacteria e.g. drug resistance plasmids, toxin-producing plasmids.

- Research project to be conducted with the assistance of the Japanese experts in genetic engineering of Gram-negative as well as Gram-positive bacteria to produce biological active substances for medical use.

MYCOLOGY

1. Study on epidemiology, pathogenesis and virulence of important mycotic agents in Thailand.

2. Histopathology on human and experimental animal tissues of mycotic infection.

3. Biotechnology.

- Study on genetic engineering of yeasts with the aim of producing biological active substances for medical use.

PARASITOLOGY

1. Surveillance of important parasitic diseases.

- To determine the incidence of intestinal parasites in human and animals.

- To establish appropriate standard measures for diagnosis of parasitic diseases.

2. Research on malaria and other blood parasite.

- Drug susceptibility of malarial parasites, medicinal plants used as antimalarial drug.

- Epidermiological study on other blood parasites e.g. schistosoma.

3. Preparation of antigens for serodiagnosis of parasitic diseases e.g. E. histolytica, Schistosomes, Toxoplasma.

IMMUNOLOGY

Immunology unit will carry out researches to solve problems on the immunological phenomenon related to human health. The following methods will be included.

1. Cell mediated immunity: cytotoxicity test, macrophage migration inhibition test, isolation and identification of lymphocytes.

2. Humoral immunity: radioimmunoassay, enzyme immunoassay, immunodiffusion, passive agglutination, purification and characterization of antibody by electrophoresis, chromatography and HPLC etc., and production of monoclonal antibody.

3. Study on the diseases related to immunological phenomenon.

4. Biotechnology for new vaccine production such as hepatitis B vaccine.

Major emphasis is on future development in genetic engineering technique in bacteriology and virology. Such biotechniques are important

in immunology of infectious diseases. Microorganisms involved are hepatitis B, JE, rabies, herpes, rota and RS viruses as well as some important bacteria and parasites.

DEVELOPMENT AND CONTROL OF BIOLOGICAL PRODUCTS

Future programmes to be carried out at NIH will be as follows:

1. Strenghthening facilities for the quality control of all biological products:- vaccines, immune sera, immunoglobulins and blood products used in the country.

2. Production and standardization of national standards and reference preperations for quality control of biological products.

3. Research on development of new biological products and improvement of already used biological products.

3.1 Test production of inactivated mouse brain Japanese encephalitis vaccine.

3.2 Test production of rabies antiserum (EQUINE).

3.3 Test production of hepatitis B vaccine in collaboration with Virus Research Institute.

3.4 Research on improvement of the toxicity of pertussis vaccine.

3.5 Research and development of living bacterial vaccine such as typhoid and cholera vaccines.

3.6 Development of component vaccines.

4. Biotechnology for the development of bacterial and viral vaccines.

4.1 Study of viral component vaccine.

4.2 Introduction of recombinant DNA technology for the development of new vaccines.

4.3 Synthesis of immunogenic peptides.

MEDICAL ENTOMOLOGY

Medical Entomology conducts activities on applied research on

vector surveillance, vector control, insecticide susceptibility of vectors to support the epidemiology, prevention and control of vector borne diseases such as DHF, JE, malaria, filariasis and typhus. Several bio-efficacy studies on pesticides are performed.

The programmes to be developed in the NIH are:

1. Studies on the natural enemies and their potential use for control moquito vectors of Japanese encephalistis, filariasis.

2. Studies on biology and ecology of the mosquitoes and insect vectors carrying diseases and also rodents habouring diseases.

3. Studies on susceptibility of insect vectors to pesticides and other control agents.

4. Studies on the control measures which consist of chemical biological, mechanical, environmental, electrical etc., in order to search for the most appropriate and efficient means with minimum cost.

5. Studies on the suitable ways to prevent and combat the outbreak of vector borne diseases by carring out field trials including community involvement and participation.

6. Museum of Medical Entomology responsible for collection of reference specimens of insect vectors and pests from different parts of the countries and possibly from other countries. To supply specimens and informations on taxonomy biology and ecology of insects to students and those who work or are interested in this field.

MEDICINAL PLANTS

Future programmes of Medicinal plants to be carried out at NIH are:-

1. Information Center for medicinal plants and traditional medicines programme:

This programme is setting up for serving the demand of informations of medicinal plants both for official and general services. Such information are piled up and bring out for further study as well as for thoroughly considered in the committees to justify the usefulness of them. About 2,000 plants information are collected. The activities carried out to fulfil this programme are:-

- Medicinal plant informations for Primary Health Care.

- Research on the international patents for the development of drugs from Thai medicinal plants.

- Center for pharmacological and toxicological informations of medicinal plants and traditional medicines.

- Reference books of medicinal plants of Thailand.

- Establishment of the computerization of the information.

- Provision of the guide to the information source.

2. Toxicological studies on medicinal plants and traditional plants and traditional medicines to be used in Primary Health Care system and those which will be included in Thai pharmacopoiea by various methods such as histopathalogical and biochemical methods.

3. Research on anti-microbial activities of medicinal plants used for malaria and other infectious diseases such as skin diseases and diarrhoea.

4. Study on pharmaceutical products from medicinal plants such as essential oil in order to set up the standard for the quality control.

ENVIRONMENTAL HEALTH SCIENCES RESEARCH

The research is responsible for conducting biological and chemical analysis, evaluating the hazards of environmental toxic substances for public safety and health promotion.

1. Toxicological Evaluation

Research on chemical biochemical and pathobiological investigations consisting of evaluation tests on various environmental toxic substance e.g. pesticides, metals, toxic anions, chemical etc. The research evaluating is performed on specimens containing environmental toxic substances, tested animal biological specimens and biological specimens from exposed persons. Pathobiological investigation includes studies from human clinical record as well as experimental animal data. The advanced research knowledge is used to issue effective safety monitoring against the environmental toxic substances.

2. Pollutant Surveillance

Environmental health science research on pollutants is aimed to make

toxicological assessment for evaluating pollutant hazards and setting precaution, regulation and other antipollution standards to minimize pollution. The same regular and analytical specimens are performed as in the programme 1 and also include inhalation toxicity testin.

3. Toxin Evaluation

Environmental health science research on toxins is aimed to make toxicological evaluation for identification and defining their degree of hazard and for survey of effective safety monitoring against the toxin exposure in the environment. The same regular methods and analytical specimens are performed as in 1.

4. Histopathology

Histopathology is the study of abnormal biology of cells and tissues by using light and electron microscope, tissue authoradiography and tissue freeze dried fracture techniques. The study needs skillfull histopathologist to evaluate the biologic disease resulting from environmental toxic substances and has direct relative investigation with that described in 1 to 3.

5. Bioassay of toxic substances

Research on toxicity of chemicals by using microorganism such as mutagenicity test.

BIOMEDICAL RESEARCH IN FOOD

Biomedical Research in Food conducts the studies on toxic substances in food, food additives, chemical and microbiological contaminants and also other related field such as pathogenic bacteriology, mycology, parasitology and toxicology.

Research programmes are as follows:-

1. Monitoring and survey of chemical contaminants in food

A nation wide survey of chemical contaminants in food causing by pollution such as pesticides, natural toxin such as biotoxin, and toxic substances occurred during processing such as kojic acid in fermented food.

2. Methodology development

Method for quantitative analysis of certain kinds of compounds in food such as food additives and contaminants will be developed and/or upgraded for more efficient accurate and suitable procedure. Also appropriate method for regional laboratories will be done to suit the equipment, manpower at each region.

3. Food Microbiology

Studies on pathogenic bacterial contamination, bacterial toxins and using microbiological technique for determination of hazardous substances in food.

4. Food Toxicology

Studies on the toxicity of individual food nutrients and contaminants by using living organism.

PHARMACEUTICAL SCIENCES

Pharmaceutical Sciences is responsible for quality assessment of medicine both in the dosage form and in body fluid. The research are performed by radioimmunoassay, physico-chemical and biological assay. The objective is to promote the better control of quality of pharmaceutical preparations.

1. Radioimmunoassay Programme

RIA Programme is dealing with the determination of minute quantity (in nanogram) of medicine in body fluids such as blood, urine etc. in which other physio-chemical methods are not able to serve the same purpose. This determination is very important in controlling the efficiency of medicine in term of therapeutic equivalence.

2. Radiopharmaceutical Products

The purpose of this programme is to prepare and perform the quality control of radiopharmaceutical products such as ^{99m}Tc, ^{125}I which will be distributed to hospitals within the country. This programme will benefit the hospitals by providing them the products of established quality and lowering their expenses in self-production.

3. Stability Studies

The stability studies of pharmaceutical preparations by physico-chemical and microbiological methods are performed. The objective of this research study is to predict the expiration date or half-life of pharmaceutical products. The DATA obtained will be used as supporting evidence in granting licence of product submitted for registration. The government deems it necessity to focus on the research in this area since the climate condition in Thailand easily cause the drug deterioration and the degradation products may lead to health hazard.

4. Animal Tests and Assays of Pharmaceutical Preparations

This programme is to analyze pharmaceutical preparations by animal assay which involves the use of intact animals, animal preparations or isolated, surviving animal tissues or organs. This animal laboratory conducts the analysis of digitaloid drugs, insulin, glucagen, etc. It is expected that upon completion of the programme drugs available in Thailand, which require animal assay will be controlled to meet the standard recommended by pharmacopoeia or Board of Health.

5. Testing and Development of Methods in the Assay of Pharmaceutical Preparation Programme.

New methods in physico-chemical and microbiological assay of drugs combination preparation will be developed. Also, the efficiency of drug products in biological fluid will be performed in this laboratory.

BIOHAZARD LABORATORY

This laboratory will be used for P-3 micro-organisms such as haemorrhagic fever with renal syndrome, rabies, street strain etc.

RADIOISOTOPE LABORATORY

Radioistope laboratory serves as the supportive activity for other laboratories. The major responsibility is involved with all experiments using radioisotopes. This activity conducts the determination of small quantities of chemical and microbiological sustances in food and in

biological specimens. The radioisotope technique would be applied to the preparation and quantitative determination of radiopharmaceutical products and to the areas of microbiology, biochemistry, pharmacology and toxicology.

The various programmes performed in this activity are as follows:

1. *Radioisotope technique in toxicology*, pharmacology, microbiology and biochemistry.

- To analyze the toxic substances (eg. cannabinoids) and their metabolites in human body fluid.
- To study the metabolism of pharmacological active compounds isolated from medicinal plants.
- DNA-DNA hydridization technique for the identification and ecological study of microorganism.
- The oligonucleotide finger-printing of viral RNA for the identification and ecological study of virus.

2. RIA in microbiology and chemical substances.

This programme deals with the RIA technique in the determination of small quantities (in nanogram) of chemical and biological substances for medical use.

3. Establishment of internal quality control of RIA experiment.

Setting up the assay protocol of RIA technique for any substances and quality conttol of those substances will be developed. The most suitable assay technique will be provided to the routine analysis concerned.

4. Production of antisera and tracers used in RI laboratory.

The antisera and tracers production of interested substances is initiated in order to supply these products to the requested RIA laboratory to fulfill the accomplishment of RIA experiments.

5. Quality assessment of radiopharmaceutical products.

Preparation and quantitative determination of radiopharmaceutical products such as ^{99m}Tc and ^{125}I will be performed. The qualified qualified products will be distributed to the hospitals which will reduced their expenses

SCIENTIFIC INSTRUMENT CENTER

The Scientific Instrument Center is responsible for the application of scientific measurements and instruments, and the utilization of computer in health science research and analysis. Accordingly, activities to be carried out here have been planned as the following programmes.

1. Scientific instrumentation services

This programme will assist the NIH in procurement, installation, application, maintenance and repair of instruments scattered in all laboratories. At the same time, it will put the CENTRAL INSTRUMENT LABORATORY on a proper track, and keep it on an effective run. To keep pace with the new techniques, methodologies and instruments, re-educations for the responsible staffs will be required occasionally.

2. Analytical instrument quality assurance

This is to establish a system for controlling and assuring the accuracy of instruments and their measurements. A proper accreditation system for health science analysis in Thailand will be able to set up as soon as possible.

3. Education programme for instrument application

For the best and most benefits of the users of scientific instruments in NIH, especially those are in the CENTRAL INSTRUMENT LABORATORY, application programmes will be arranged at various proper occasions. And also for the need of brushing-up the knowledges in instrument for the in-service health service officers, periodical training programmes have been planned.

4. Establishment of the NIH computer network system

This is to give technical supportations in setting-up and developing the system hard-ware, soft-ware and people-ware. Afterward, we are going to pave the way for management and supervise of the implementation of the system.

5. Organization and management of the NIH data base

This is to organize and manage the data base for the NIH interactivity information service. It may be, in the near future, a very important source of public health information.

6. Education programme in computer education

This is to carry out education programmes in utilizing the computer for scientific analysis and research for staffs in NIH. It is not a programme to produce any computer expert, but to provide adequate knowledge of using the computer.

ANIMAL EXPERIMENT CENTER

To assure correct experiment, defined laboratory animals must be used. These animals are those bred and produced under controlled conditions and maintained in controlled environment, with clear genetic and microbilogical background obtained by regular monitoring. Ths use of such defined laboratory animals is a prerequisite for obtaining reproducible results in animal experiments. Future programme at NIH will be as follows:-

1. Animal use and care.

Animal used for experiment purposes in NIH will be lawfully aquired from Mahidol Animal Center: or Dept. of Animal Husbandry, Kasetsart University; or other private sellers. Standing Committee will be maintained to set policies and guidelines for the use and care of animals in experiments. The housing, care and feeding of all experimental animals will be supervised by qualified veterinarian or other biological scientist competent in such consideration for their comfort, kind treat, proper feed and their surrounding kept in a sanitary conditions.

2. Experimental animals.

Infected and non-infected experimental animal area will be separated and have appropriate house design and facilities, such as good design of barriers and suitable space requirement, good methods of providing environmental control suited to the requirements.

Experimental involving live animals will be performed by or under supervision of a qualified biological scientist. If an acute study does not require survival, the animal will be killed in a human manner and ensures immediate death.

3. Animal production.

There will be three systems, namely; conventional, specific

pathogen free (SPF) and germ free animals. At the present only conventional animals are produced eg. mice (Swiss mice), bulb with strain mice and nude mice.

4. Animal pathology and histopathology.

Pathological study will be made in infectious diseases common to human and animals and also diseases of experimental animals.

Animal histopathology will be studied when the test materials cause toxicity to the living cell leading to the abnormality of the organ and finally may cause cancer or teratogenicity. This laboratory will also responsible for the evaluation of any toxicity occuring from products intended to use as drug, food and environmental hazardous substance. Generally, it can be devided into 2 major parts.

4.1 Tissue processing technique:- Preparation of tissue for microscopic examination including fixation, dehydration, clearing, embedding, sectioning, mounting and staining.

4.2 Examination and interpretation:- Histologist may use several sectioning technique if the problem in the interpretation of tissue section are happened. The next steps may use EM, scanning electron microscope and radioautography. Examination of the living cells and tissues, differential centrifugation and also histochemical and cytochemical principle are involved for studying substance of biologic content.

REGIONAL MEDICAL SCIENCES CENTER

There are 6 regional laboratories located in Songkhla, Chon Buri, Nakorn Ratchasima, Khon Kaen, Chiangmai and Phitsanulok. The major objective is to provide the good health to the people in the rural areas. At present, the responsibility of those 6 established regional laboratories is to serve the people health in the area of food, drug, toxic substances and clinical pathology.

The important new activities are as follows:

1. Transfer technology: To act as the main laboratory in helping the provincial hospitals to set up the health laboratories.

2. Health hazard protection: To protect the health hazard and surveillance on the safety of food, drug and environmental health. These include the determination of toxic substances in food and water eg. pesticide residues, metals, food additives and toxic substances in pharmaceutical preparations. Evaluation of the hazard of environmental toxic substances for public safety will be performed as well.

3. Research facilities: To serve as the extension basis for public health research projects outside Bangkok by collaborating in the analysis with the central laboratory.

4. Training/workshop facilities: To train the local clinical laboratory technicians for rapid and appropiate diagnostic methods.

資料 2.2 NIH研究課題

資 2.2.1 Virology

(A) Subjects of research in progress

1. Rabies vaccine production.
2. Rabies diagnosis, research and survey.
3. Studies on viral hepatitis by immunochemical methods.
4. Seroepidemiological surveys for diseases caused by arboviruses.
5. Isolation and characterization of DHF virus.
6. Study to improve JE vaccine.
7. Enteric viruses, including epidemiology, isolation and characterization of virus as well as serological researches.
8. Paramyxoviruses, including diagnosis, isolation and characterization of virus.
9. Diagnosis of rubella.

(B) Future development in research

1. Surveillance and research on chlamydia and rickettsia.
2. Research on oncogenic viruses.
3. Research to support the National Epidemiological Program.
4. Studies on molecular virology (dengue, polio, JE).
5. Research to devlope viral vaccines (Rabies, Hepatitis, JE) by attenuation of virus strains and biotechnology.

資 2.2.2 Bacteriology, Mycology and Parasitology

A. Subjects of research in progress or in near future (1-3 years)

<u>Bacteriology</u>

1. Preparation of coagglutination reagent for identification of β-hemolytic streptococci. (1984-1985)

2. Drug sensitivity of glucose-nonfermenting gram negative rod bacteria. (1984-1985)

3. In vitro susceptibility and β-lactamase production of enteropathogenic *E.coli*, *Shigella* spp., *Salmonella typhi* and *Salmonella paratyphi A*. (1984)

4. Biken's test and reverse passive latex agglutination for detection of heat-labile enterotoxin of enterotoxigenic *Escherichia coli*. (1983-1985)

5. Epidemiology of *Clostridium difficile* in Bangkok. (1984-1986)

6. Phage typing of *Salmonella typhi* and *Salmonella paratyphi A*. (1984-1985)

7. The study of phage typing of *Vibrio cholerae*. (1984-1985)

8. Comparison of various methods in demonstration of carbodydrate breakdown by glucose-nonfermenting gram negative rod bacteria. (1984-1985)

9. Preservative media for *Campylobacter jejuni*. (1984-1985)

10. Comparative in vitro activity of ofloxacin (DL-8280) and other antimicrobial agents against enteric and miscellaneous bacteria. (1984-1985)

11. Quantitative susceptibility test of nonfermentative gram-negative rod bateria to 23 antibacterial agents. (1985-1986)

Mycology

1. Study of pathogenesis and virulence of *Crytococcus neofermans* from pigeon dropping and soil and the controlling method. (1984-1985)

2. Study of esculin utilization of *Candida albicans* and *Candida stellatoidea* as a method of identification. (1984-1985)

3. Prevalence of sporotrichesis in the Thai population and the isolation of Sporotrichum schenskii from soil and other soil contaminated material. (1985-1987)

Parasitology

1. Determination of drug sensitivity of *Plasmodium falciparum* in Chanthaburi province by applying the in vitro simple field kit. (1985-1986)

2. A survey of the prevalence and occurrence of trichinosis in house rat in Bangkok. (1984-1985)

3. A survey of prevalence and occurrence of the intestinal parasites in students in Patumtani province. (1984-1985)

4. A survey of parasitic infection in the Thai population of Southern Thailand. (1985-1987)

Serology

1. Fluorescent Treponemal - antibody absorption test (FTA) and Treponema pallidum hemagglutination assay (TPHA) for confirmation of syphilis. (1984)

Biochemistry

1. High density lipoprotein cholesterol. (1984)
2. Glycosylated hemoglobin in diabetic patients. (1984-1985)

B. Future development in research

Bacteriology

1. Mycoplasma
2. Introduction of molecular genetics in bateriology. (e.g. drug resistance etc.)
3. Development of new method for the identification and classification of bacteria. (e.g. DNA-DNA hybridization technique)
4. Nosocomial infections.
5. Etiological studies of respiratory and intestinal infections.
6. Pathogenic factors of microorganisms in terms of molecular biology. (toxin, cellular component etc.)

Mycology

1. Study of epidemiology, pathogenesis and virulence of important mycotic agents in Thailand.
2. Study on histopathology on human and experimental animal tissues of mycotic infection.
3. Study on genetic engineering of yeasts for medical applications.
4. Study on various toxin - producing fungi.

Parasitology

1. Drug susceptibility of plasmodia.

2. Antigen analysis of plasmodia.

資 2.2.3 Immunology

1. The study of applied immunology in monoclonal antibody production.

2. Research on purification of immunoglobulin G.

3. Research on type specific Dengue haemorrhagic fever in Rayong, using oligonucleotide finger pinting method.

資 2.2.4 Biological Product

A. Subjects of research in progress

1. Test production of tetanus antitoxin by hyperimmunization of horses.
2. Test production of purified and concentrated tetanus antitoxin.
3. Test production of semi-purified inactivated mouse brain Japanese encephalitis vaccine.
4. Production and standardization of National Reference Standard calibrated against International Reference Standards. e.g. Rabies Vaccine, Cholera Vaccine etc.
5. To improve method of purification and concentration of anti-snake venom sera for higher purity.
6. Stability test of antisnake venom sera.
7. Stability test of typhoid vaccine.

B. Future development in research.

1. Strengthening facilities for the quality control of biological products.
2. Research on development of new biological products and improvement of biologicals used. (Rabies antiserum, JE vaccine Hepatitis B vaccine.)
3. Research and improvement of the toxicity of pertussis vaccine.
4. Biotechnology for development of bacterial and viral vaccines.

資 2.2.5 Medical Entomology

A. Subjects of research in progress or in near future (1 - 3 years)

1. A study on *Aedes aegypti* absolute larval density in covered and - uncovered water jars.
2. *Aedes aegypti* surveillance through school children via questionaires.
3. Monitoring Japanese Encephalitis Vectors in various parts of Thailand.
4. Head lice surveillance in schools in rural.
5. Sumithrin 0.4% for treatment of head lice.
6. Susceptibility testings of *Aedes aegypti, Culex quinquefasciatus,* flies, cockroaches.
7. A study on Dimilin sand granules in simulated jars.
8. A field trial of K-orthrine 15-15 against *Aedes aegypti*.
9. A field trial of cyfluthrin plus fenfluthrin against *Aedes aegypti* using Fontain R_{12}.
10. Pesticide applicator testings.
11. A collection, isolation and efficiency test of local pathogenic bacilli against mosquito larvae.
12. The persistence of *Bacillus sphaericus* 1593 against *Culex sp.* under laboratory and field conditions.
13. A control of *Culex quinquefasciatus* by *Bacillus sphaericus* 2362
14. A survey and study on biology of natural enemies of house fly.
15. A field trial of *Bacillus thuringiensis* H-14 sand granules against *Aedes aegypti*
16. Communify Patricipation in *Aedes aegypti* Control second year: School approach.
17. Study on effects of methoprene against *Aedes agegypti* larvse, *Culex quinquefasciatus* larvae and *Musea domestica* larvae.
18. Village scale field trials of new pesticides or new agents insect vectors and domestic insetcs.

19. To use the medical insecticide to reduce the population of Japanese encephalitis vector.

20. A study on environmental manipulation for controlling of *Culex quinquefasciatus*.

B. Future development in research

1. Studies on the population dynamics of JE-vectors after long operation light-traps *I. Village Trial*.

2. Surveillance for JE-virus in *mosquito vectors* in endemic areas.

3. A study on physiological age of *C. tritaeniorhynchus, C. gelidus, C. fuscocephala* in Thailand.

4. A study on population dynamics of cockroaches in Thailand.

5. A study on population dynamics of houseflies in Thailand.

6. Studies on the effects of chemicals substances as attractants and repellant for potential use in control measures.

7. Village scale field trials of new pesticides or new agents against insect vectors and domestic insects.

8. Village scale field trials of new pesticides applicators and pesticide applicators development.

9. A study on environmental manipulation for controlling of *Culex sp.*

10. Teacher participation in head lice control.

11. A Study on population density of head lice among school children.

12. Susceptibility testings of *Aedes aegypti, Culex quinquefasciatus, Culex tritaeniorhynchus,* flies and cockroaches.

13. A study on age determination of commensal prodents in Thailand.

14. Efficacy tests of different rodenticides on commensal rodents in Thailand.

15. Community participation in integrated control of JE vectors in one district.

資 2.2.6 Medicinal plant.

A. Subjects of research in progress or in near future (1-3 years)

1. Exploration and botanical study on medicinal plants used as antimalaria drug (1984)
2. Exploration and collection of clove in Thailand (1984-1988)
3. Cinchona plantation (1972-1987)
4. Development of medicinal plant garden (1983-1985)
5. In vitro response of *P. falciparum* to chemical constituents isolated from Thai medicinal plants (1982-1985)
6. Analysis to set up the quality control of Thai medicinal plants (1982-1987)
7. Phytochemical study on Thai medicinal plants used as anti-diabetic (1982-1985)
8. Pharmacokinetics of Bronchodilating compound in Plai (1982-1984)
9. Pharmacokinetics of anti-inflammatory compound in plai (1984-1986)
10. Blood levels of bronchodilating compound following oral administration of plai preparation (1984-1986)
11. Constituents of *Zingiber cassumunar* as anti-inflammatory agents (1984-1985)
12. Hepatotoxicity plants in Thailand (1983-1985)
13. Toxicity of the leaves of Bridelia siamensis (1984-1985)
14. Development of berberine from Kamin-krua (1983-1985)
15. Effect of medicinal plants ingestion in rats determined by the conditioned taste aversion procedure (1984-1985)
16. Experimental production and development of Thai traditional preparation for Primary Health Care.(1984-1986)

B. Future programmes of Medicinal plants to be carried out at NIH are:-

1. Information Center for medicinal plants and traditional medicines programme:

This programme is setting up for serving the demand of informations of medicinal plants both for official and general services. Such informations are piled up and bring out for further study as well as for thoroughly considered in the committees to justify the usefulness of them. About 2,000 plants information are collected. The activities carried out to fulfil this programme are:-

- Medicinal plant informations for Primary Health Care.
- Research on the international patents for the development of drugs from Thai medicinal plants.
- Center for pharmacological and toxicological informations of medicinal plants and traditional medicines.
- Reference books of medicinal plants of Thailand.
- Establishment of the computerization of the information.
- Provision of the guide to the information source.

2. Toxicological sutdies on medicinal plants and traditional medicines be used in Primary Health Care system and those which will be includ in Thai pharmacopoiea by various methods such as histopathalogical a biochemical methods.

3. Research on anti-microbial activities of medicinal plants used for malaria and other infectious diseases such as skin diseases and diarrhoea.

4. Study on pharmaceutical products from medicinal plants such as essent oil in order to set up the standard for the quality control.

資 2.2.7 Environmental Health Sciences (Toxicology)

(A) Subjects of research in progress or in near future (1-3 years after the establishment of NIH)

1. Relationships between red blood cell and serum cholinesterase values, blood organophosphates and their metabolites with the insecticide clinical symptom.
2. Pollutant surveillance of detergent
3. Mycotoxin evaluation
4. Toxicological evaluation on pesticides.

(B) Future development in research

1. Toxicological evaluation
2. Pollutant surveillance
3. Toxin evaluation
4. Histopathology
5. Toxic Bioassay

資 2.2.8 Biomedical Researcl in Food

A. Subjects of research in progress or in the near future (1-3 years)

1. Monitoring of pesticide residues in food.
2. Pesticide residues in agricultural produces.
3. Epidemiology of liver cancer in Thailand: To study the content of Aflatoxin, Nitrate, Nitrite, Nitrosamine and Organochloride insecticide in native foods and/or blood samples.
4. Occurrence of red tide in the gulf of Thailand: pesticides and heavy metals in molluscs.
5. Dietary intakes of chemical contaminants in Thailand.
6. Determination of nitrosamines in local Thai foods.
7. A study of vendor food hygiene in densely populated areas in Bangkok.
8. A review on the study of salmonellae and antibiotic residues in meat.

9. Antibiotic residues in animal tissue meat and liver.

10. Method development for pesticide residues analysis.

11. Determination of water soluble vitamins in caffeinated drinks by HPLC.

12. Quantitative analysis of colour used in Thai dessert.

13. Determination of hormone in food.

14. High pressure Liquid Chromatographic Determination of Ethylenediaminetetraacetic Acid (EDTA) in Canned Sea Foods.

15. Total Caffeine intake by Bangkok residents.

16. Quality assessment of vendor soy bean milk in markets.

17. Survey of plastic milk bottles and caps in Thailand.

B. Future development in research.

1. Conducting a nationwide survey on food contaminants causing by environmental pollution, e.g. foodborne microorganisms, pesticide residues, heavy metals and industrial waste.

2. Study on the actual intake of contaminants and additives.

3. Methodology development for qualitative analysis of good including appropriate methods for regional laboratories need.

4. Study on toxicology of local food from animal and plant origins for example antibiotic residue in poultry and meat.

資 2.2.9 Pharmaceutical Sciences

(A) Subjects of research in progress in near future (1 - 3 years)

1. An in vitro and in vivo study on bioavailability of Digoxin tablet. (1985)
2. An in vitro and in vivo study on bioavailability of Depo-Medroxy progesterone Acetate (DMPA) for family planning.(1985 - 1987)
3. Study on the stability of pharmaceutical preparations containing Aspirin and Paracetamol. (1985 - 1986)
4. Stability of oral suspension of antibiotics. (1984 - 1985)
5. Study of gamma - irradiated Tetracycline HCl Ophthalmic Ointment (1984 - 1986)
6. Research on animal assay of Insulin and other hormones. (1986 - 1987)
7. Testing and development of methods in the assay of pharmaceutical preparations. (1984 - 1990)

(B) Future development in research

1. Intiation of radioimmunoassay (RIA) technique for quality control of pharmaceuticals, production of antisera and tracer used in RIA Laboratories.
2. Quality control of radio-pharmaceutical products.
3. Study on the stability of pharmaceutical preparations.
4. Animal tests and assays of pharmaceutical preparations.
5. Testing and development of methods for the assay of pharmaceutical preparations.

資2.2.10 Project Planned using Radioisotope Laboratory

Radioisotope laboratory will include all the radioisotope experiments performed in the Department of Medical Sciences. The Main activity will be initiated at the NIH are:

1. Radioimmunoassay of drug, poisons and hormones in biological

specimen.

2. Radioimmunoassy in Microbiology
3. Establishment of Internal Quality Control of RIA experiments in the Department of Medical Sciences
4. Quality Control Assesment of Radio pharmaceuticals.
5. Radioisotope technique in Toxicology, Medicinal plant and Microbiology.
6. Production of antisera, tracers, standard substances and Quality Control Specimen for radioisotope works.

(1) Isotopes used and estimated quantity

Radioisotopes	Radiation	Estimated quantity per year	T 1/2
1. ^{3}H-	beta	20 mCi	12 Yr.
2. ^{14}C	beta	20 mCi	5730 Yr.
3. ^{35}S	beta	20 mCi	87 day
4. ^{125}I	gamma	24 mCi	60 day
5. ^{99m}Tc	gamma	1000 mCi	6 hrs

Other radiopharmaceuticals will be included in the project if feasibility allow in the future.

(2) Waste disposal

1. Disposal of hot specimens, solid waste, including lift over radioactive from experiment will be the responsibility of the Office of Atomic Energy for Peace.

2. Low level of radioactive waste from experiments in washing water and air will be the responsibility of NIH. The level of radio active amount will be as low as microcuries per year. Waste water will be decontaminated before disposal to the sewage system. Polluted air will be filtered by appropriate filtering system.

(3) Projects performed in RI-laboratory are as follows:

1. Radioisotopic study on the effect of medicinal plant on Plasmodium falciparum.

   (Responsible Activty: Parasitology)

2. Radioimmunoassy of active constituents isolated from medicinal plant in biological specimen.

   (Responsible Activity: Medicinal Plant Research)

3. Radioisotope technique in medicinal plant research.
   (Responsible Activity: Medicinal Plant Research)

4. The analysis of cannabinoids and their metabolites in human body fluid.
   (Responsible Activity: Environmental Health Science)

5. Extraction efficiencies for pesticides residue in food.
   (Responsible Activity: Biomedical Research on Food)

6. Determination of Steroid hormone by radioimmunoassay.
   (Responsible Activity: Biomedical Research on Food)

7. An in vitro and in vivo study on bioavailability of digoxin tablet.
   (Responsible Activity: Pharmaceutical Sciences)

8. An in vitro and in vivo study on bioavailability of Depo-Medroxyprogesterone Acetate (DMPA) for family planning.
   (Responsible Activity: Pharmaceutical Sciences)

9. Production of antisera and tractor used in radioimmunoassy laboratory.
   (Responsible Activity: Pharmaceutical Sciences)

10. Housing labelling compound for medical uses.
    (Responsible Activity: Pharmaceutical Sciences and Radiation Protection Services)

11. Radioimmunoassay and RI technique in Microbiology
    (Responsible Activity: Virology and Bacteriology)

2.2.11. カウンターパート

ウィルス学

Miss Kanai Chatiyanonda	M.D. (Director)
Miss Kruavon Balachandra	B. Sc.
Mrs. Nonglak Asavachinda	M.D., Ph.D.
Mr. Siri Sawasdikosol	D.V.M.
Mrs. Sompop Ahandrik	M.D.
Mrs. Sumalee Boonmar	B. Sc., D.V.N.
Miss Suntharee Rojanasuphot	B. Sc.
Mrs. Suranga Saguanwongse	B. Sc.
Mr. Suwicha Kupradinun	B. Sc., D.V.M.
Miss Wallapa Isrankul Na Ayuthya	B. Sc.
Mrs. Yoawapa Pongsuwanna	B. Sc., D.V.M.

細 菌 学

Mrs. M.L. Ratanasuda Phan-Urai	M.D. (Director)
Miss Kanitha Vatcharasingha	B. Sc.
Miss Krongkaew Supawat	B. Sc.
Miss Orn-anong Ratchtrachenchai	B. Sc.
Mrs. Panthip Sinthuwongsanondh	B. Sc.
Mrs. Prapawadee Booncharoen	B. Sc.
Miss Renu Sunthadvanich	B. Sc.
Mrs. Siripan Wongwanich	M. Sc.
Mr. Surachai Tishyadhigama	M.D.
Mrs. Surang Dejstrilert	M. Sc.

（真菌学）

Mrs. Vinita Boriraj	M.D., Ph.D.
Miss Jotika Boon-Long	B. Sc.
Miss Natheewan Punwan	M. Sc.

（寄生虫学）

Miss Sugunya Gateium	M. Sc.

免 疫 学

Mrs. Chuinrudee Jayavasu	M.D.
Mr. Wattana Auwanit	M. Sc.

生物製剤

Mr. Smarn Pongpairoj	M. Sc. (Chief)
Mr. Boonruam Chokuaychai	D.V.M.
Mrs. Kanchana Lelasiri	B. Sc.
Mrs. Teeranart Jivapaisarnpong	B. Sc.
Mr. Teerapon Kachacheewa	B. Sc.

医昆虫学

Mrs. Boonluan Phanthumachinda	M.D. (Director)
Mr. Anusorn Malainual	B. Sc.
Mr. Banyong Matcum	B. Sc.
Mr. Kasin Suphapathom	B. Sc.
Mr. Mongkol Chenchittikul	M. Sc.
Mrs. Pimpa Vatanachai	M. Sc.

Mr. Prakong Phan-Urai	M. Sc.
Mr. Somkiat Boonyabancha	B. Sc.
Miss Suntharee Rojanasuphot	M. Sc.
Mr. Thumrong Phonchevin	M. Sc.
Miss Usawadee Thavara	M. Sc.
Mr. Wirat Samutrapongse	B. Sc.

薬用植物学

Miss Panida Kanchanapee	M.D. (Director)
Mr. Amporn Kun-anake	B. Sc.
Mr. Daroon Pecharaphy	M. Sc.
Mr. Komol Sawasdimongkol	M. Sc.
Mrs. Nathrudee Sittisomwong	B. Sc.
Mrs. Passara Ngearndee	B. Sc.
Miss Pittaya Tuntiwachwuttikul	Ph D.
Mrs. Renu Koysooko	Ph D.
Mr. Suthipong Taweepanyawong	B. Sc.
Miss Thaweephol Dechatiwongse	B. Sc.
Mrs. Wantana Ngamwat	B. Sc.

食品・生物学・医学的研究

Mrs. Chaweewan Halilamian	(Director)
Miss Amara Kingkate	Ph. D.
Miss Amara Vongbuddhapitak	B. Sc.
Miss Churairat Rungrojanarak	M. Sc.
Miss Panadda Sae Eung	Ph. D.
Mr. Prakai Boriboon	B. Sc.

環境衛生科学

Mr. Alan Idsavas	(Director)
Mr. Bumroong Kongdee	B. Sc.
Miss Lagsana Leuprasert	B. Sc.
Mr. Somboon Suphachearabhan	B. Sc.
Miss Sumol Pavitranon	M. Sc.

薬　理　学

Miss Boonlarp Kitisin	(Dicretor)
Mrs. Arpapun Tongloonrawd	B. Sc.

Miss Chantana Wessapan	B. Sc.
Mrs. Sangthong Sawasdiphab	M. Sc.
Miss Wanida Suchonwanit	B. Sc.
Miss Wiyada Charoensiriwatana	M. Sc.

放射能委員会

Mr. Paiboon Sa-Ngobwarcha	M.D. (Director)

科学機器センター

Mr. Somkiat Wagkobkiat	Ph. D. (Chief)
Mr. Chusak Chumnanyantarakit	B. Sc.

資料 2 － 3

Animal Experiment Center

A. Keeping animals

1. Kind and quantity of normal animals to be raised

- Inside

4,600 white mice	560 guinea pigs	hamsters
760 rats	600 litters of suckling mice	cats
	250 rabbits	5 monkeys

- Outside

15 sheeps	5 geese	5 roosters
100 hens	10 dogs	

2. Kind and quantity of animals to be breeded

- 500 guinea pigs/month
- 4,500 suckling mice/month

3. Plan of purchasing normal animals and Specific Pathogen Free (SPF) animals

- About 1000 white mice per month will be purchased from Animal breeding Center, Mahidol University.
- Five sheeps and 5 geese will be purchased and be raised for breeding once a week.
- About 300 SPF - suckling per year and 25 SPF - gestating per your will be purchased from animal experimnnt center.
- Rabbit and the other animals will be purchased from the animal dealer by the order of researcher.

4. Estimate number of personnel

- 1 veterinarian
- 3 assistants
- 12 workers (4 workers per floor)
- 1 administrative staff

5. Securing and raising system in the nighttime and holiday

- The workers of the Center will work on holiday for washing, cleaning and feeding in animal breeding room.
- Researchers will have responsibility (feeding) in their own experiment animals every day.

6. Specification of feed, bed, cage, breeding shelf and so on

- feed - animal pellet, some vegetables and grass
  bed - sawdust for bedding
  cage

Animal	Size (cm)	
Mouse	32x21x11	Aluminium cage
	30x17x16	
Rat	30x35x20	
Guinea pig	25x25x25	Wire-cloth cage
Rabbit	48x61x46	
Monkey	55x80x130	
Dog	90x180x90	
Cat	60x60x60	
Rooster	60x60x60	

7. System of changing footwear and cloth in this Center

- The Center will provide footwear and clothes for changing before entering the Center in the change rooms of each floor.

B. Research activity

1. Mode of operation for common use

- Inoculate arbovirus antigen to intracerebral of suckling mice
- Inoculate rabies virus to intracerebral of adult mice
- Bleeding of sheep, guinea pig and goose for the other experiments
- Inoculation of biological antigen to intramuscular and subcutaneous of rabbit and mouse

2. Kind of animal experiment to research in each unit

VRI - Arbovirus antigen preparation in suckling mouse

- Viral antiserum production in rabbit and mouse
- Rabies virus neutralization test in mouse
- Cultivation of rickettsia and chlamydia in mouse
- Study on oncogenicity of viral agent in mouse and rabbit

Food analysis division

- Biotoxin testing in mice

Bacteriology and parasitology

- Preparation of antiserum to bacteria and parasite in rabbit

Immunology

- Preparation of anti-immunoglobulin in rabbit and mouse
- Production of monoclonal antibodies in mouse

Drug analysis

- Drug efficacy study in dog
- Pyrogen testing in rabbit

Biological product

- Quality control of biological products in mouse, rabbit and guinea pig
- Development of biological products in guinea pig, rabbit, and sheep

Medical Research division

Pharmacology

- Evaluation of drugs for their effectiveness in animals (mouse, rat, guinea pig, rabbit and dog or cat) either in vivo or in vitro.
- Toxicological evaluation of the proposed substances intended to use as drugs in various species of animals.

Pharmacokinetics

- Study absorption, metabolism and excretion of drug in normal rats

Production and safety test

- Acute toxicity testing in mice
- Acute and chronic toxicity testing in rats
- Sub-chronic and chronic toxicity in rabbits

3. Kind of SPF animal experiment

Biological product

- Standard challenge virus preparation in mouse
- Reference viral vaccine preparation (animal origin) in sheep and mouse

資料2.4　医科学局各部の要望（1984年12月）

資2.4.1.　専門家派遣（44名）

ウイルス学
- ラジオイムノアッセイ
- リケッチア（新設）
- 生物工学（ワクチン開発）
- オリゴヌクレオチド・マッピング

細菌学
- マイコプラスマ（新設）
- 細菌毒素
- 細菌遺伝学
- 細菌分類（新分類法導入）

真菌学
- 真菌分類同定

寄生虫学
- 免疫学的診断法開発

免疫学
- 細胞性免疫
- 体液性免疫

生物製剤
- 細菌性ワクチン開発・管理
- ウイルス性ワクチン開発・管理
- 免疫グロブリン開発
- 血液製剤管理

医昆虫学
- 昆虫生態学
- Ectoparasite
- 昆虫細菌（昆虫防除用）
- 昆虫分類学
- Behaviour Science

薬用植物学
- 毒性及安全性試験法（2名）
- 生薬評価
- 生薬化学
- 薬理作用機序

環境衛生科学
- マイコトキシン
- 癌原性物質分析法
- 環境汚染毒性物質（2名）

食品の医学生物学的研究
- 細菌性食中毒
- 癌原性物質分析法
- ホルモン検出法

薬理学
- 新抗生物質検定法
- バイオアッセイ・統計学
- ラジオイムノアッセイ
- リムリステスト
- 薬剤の安定性試験法

その他
- 実験計画法・統計学（2名）
- 実験動物管理
- 機器センター（4名）

資 2.4.2. 研修生受入（58名）

ウイルス学
- リケッチア・クラミジア（新設，2名）
- 生物工学（ワクチン開発）
- CMV・EBウイルス
- 電子顕微鏡

細菌学
- マイコプラスマ（新設）
- 細菌遺伝学
- 細菌分類（新分類法導入）
- 生物統計
- 免疫化学技術導入
- 感染症細胞性免疫

真菌学
- 真菌分類同定，血清学

寄生虫学
- 試験管内培養法

免疫学
- 細胞性免疫
- 体液性免疫

生物製剤
- 百日咳ワクチン毒性研究
- ウイルス性ワクチン力価試験
- 細胞性免疫
- 免疫グロブリン開発，管理
- 免疫化学
- 生物工学（ワクチン開発）

医昆虫学
- 昆虫生態学・生物学
- 分類学
- 昆虫毒素（細菌毒素など）
- 昆虫防除法
- 統計学

薬用植物学
- 生薬学
- 植物学
- 植物化学
- 有機合成法
- 薬理学
- 薬理作用機序

環境衛生科学
- マイコトキシン
- 環境汚染毒性物質
- 毒性物質動物試験法
- 化粧品検査法（有毒物質）
- 吸入試験法

食品の医学生物学的研究
- 食品化学
- プラスチック毒性試験法
- 食品成分の酵素利用検査法
- 食品科学（製造→最終製品まで）

薬理学
- 医薬品安定性試験法（2名）
- 抗生物質試験法（2名）
- 統計学
- ラジオノムノアッセイ（2名）
- 医薬品動物試験法
- 生理学実験法
- 薬理学実験法

その他
- 実験動物管理
- 機器センター（6名）

資　料　3

THE SUMMARY REPORT

ON

THE SECOND PRELIMINARY SURVEY

FOR THE TECHNICAL COOPERATION WITH

THE NATIONAL INSTITUTE OF HEALTH PROJECT

IN THE KINGDOM OF THAILAND

January 16, 1985

The Second Preliminary Survey Team

I Introduction

In response to the request from the Government of the Kingdom of Thailand, the Government of Japan agreed to the construction of the National Institute of Health in the Department of Medical Sciences, Ministry of Public Health (herein after referred to as "DMS"). Both governments exchanged the agreement on the 8th of June, 1984

In accordance with the above agreement, the National Institute of Health (herein after referred to as "NIH"). Project will begin as scheduled in 1985 for several years.

In order to start the NIH Project, the Record of Discussion (herein after referred to as "R/D") Mission will be dispatched from Japan to Thailand in near future.

Due to the preparation of the R/D, which the R/D Mission will conduct, the Second Preliminary Survey Team (herein after referred to as the "Team") was dispatched from November 20, 1984 to January 19, 1985.

The task of the Team is to review and confirm major points incorporated in the reports made by the Basic Design Study Team (Nov. 15, 1983-December 7, 1983) and the First Preliminary Survey Team (July 22, 1984-July 31, 1984). Also the purpose of the Team is to collect practical and detailed information and to have intensive discussions on the technical cooperation for the NIH.

II The activities of the Team

The team appreciates the kind cooperation of Thai counterpart rendered to us.

The following activities were done by the Team.

(Omitted refer to Text 2.1.)

III The Summary of the Survey

The Team carried out the following discussions and surveys with the Thai authorities concerned.

1. Background and Justification of the NIH Project

With the cooperation of grant aids from the government of Japan the National Institute of Health (NIH) will be established in the Department of Medical Sciences, Ministry of Public Health. The Department of Medical Sciences has been responsible mainly for promoting Health Laboratory Services and Medical Research. The new NIH will be established to serve solely medical research while medical laboratory services will continue the activities in the present place. The activities of the NIH would start right after completion of the building at Nonthaburi in 1987. The DMS will have 375 personnel working in NIH. The annual budget for running the project would be approximately 13 million baht in the first year and 18 million baht on the fifth year. (salaries and wages not included)

To be ready for starting up research activities at the NIH right after completion of the building in 1987 and to continue the effective and efficient research output, the Technical Cooperation in the forms of experts, fellowships and equipment is needed.

2. Technical Cooperation Project

(1) Objectives

The NIH will carry out health sciences research to support health promotion of the whole nation. Fundamental and applied research in different fields of microbiology and environmental health are to carry out to serve for solving health problems, consumers protection, diseases prevention and control and to support the Primary Health Care Project.

The aim of the Japanese technical cooperation is to promote research activities of the NIH.

(2) Organization of the NIH

The Government of Japan and the Government of the Kingdom of Thailand exchanged the Minutes of Discussions, concerning the Grant Aid Project on the 8th of June 1984, so that the construction of the NIH buildings was

begun. Since that time the construction of the NIH buildings has been progressing satisfactorily.

The equipment and facilities, provided by the Grant Aid Project, are expected to be satisfactorily completed in October 1986.

Committees for the implementation of the NIH project are discussed and investigated. The organization of NIH, the relationship of NIH to DMS and to other institutes are shown in appendix 1, 2 and 3 respectively.

(Appendix 1, 2 and 3: omitted, refer to Text 6.3 and Figures 6-1, 6-2 and 6-3)

(3) Project Activities

It is desirable that the main project activities are to provide guidance and advice indicated to Appendix 4. The team received the requests and advice regarding the NIH project activities from the Thai authorities concerned as indicated in Appendix 5. The Team considers that it is necessary to realize those requests. As the contents of those requests expand wide fields and involve high level of technology, the Team will report and convey detailed intentions and requests to the Government of Japan. Studies and discussions will continue to be made concerning the possibility of Technical Cooperation for the NIH Project which will have a limited duration with a limited staffs of Japanese experts.

(4) The draft of the R/D on the Technical Cooperation with the NIH Project.

The draft of the R/D on the Technical Cooperation with the NIH Project is as stated on the attached sheet.

Technical Cooperation Project		
The NIH activities	The project activities	Target to be acheived at NIH
	The main project activities are to support health promotion of the whole nation.	
1. Virology The responsibility of the Virus Research Institute: Fundamental and applied research in virology and related fields: isolation and identification of virus, seroepidemilogical study of viral diseases, activities as the reference center for laboratories, production of diagnostic antigens and antisera for distribution to other laboratories, cooperation as a WHO National Influenza Center, a WHO National Hepatitis Center and a National Serum bank.	(Design Criteria) 1. Virology 1.1 To cooperate in studies on diagnosis, survey, and research in virus diseases. 1.2 To raise the capability to study on molecular virology, interferon, monoclonal antibody and biotechnology for the new viral vaccines. 1.3 To establish a laboratory for rickettsia, chlamydia and oncogenic virus.	1.1 To provide virological information for the whole country and establish a reference laboratory center for rapid diagnosis of the infectious diseases. 1.2 To promote the basic research on fundamental and applied virology. 1.3 To develop new field of research.

Technical Cooperation Project		
The NIH activities	The project activities	Target to be acheived at NIH
	The main project activities are to support health promotion of the whole nation.	
2. Bacteriology, Parasitology, Mycology The responsibility of "bacteriology, mycology and parasitology units": Fundamental and applied research in bacteriology, mycology and parasitology; survey of the infectious diseases based on the laboratory examination, activities as the reference center for laboratories, production of diagnostic antigens and antisera, cooperation as a National WHO Salmonella and Shigella Center, cooperation for the SEAMIC Data Exchange Project.	2. Bacteriology, Parasitology, Mycology 2.1 To advise regarding the laboratory technique and to cooperate to carry out research work on etiology, epidemiology and immunology of various bacterial, parasitic, mycological diseases. 2.2 To raise the capability to study on the pathogenicity of bacteria. 2.3 To train on study on bacterial genetics.	2.1 To establish a standard central and reference laboratories of the country. 2.2, 2.3 To promote the research on fundamental and applied bacteriology. mycology and parasitology.

Technical Cooperation Project		
The NIH activities	The project activities	Target to be acheived at NIH
	The main project activities are to support health promotion of the whole nation.	
3. Immunology The responsibiligy of "immunology unit": This will be newly established to promote comprehensive research on immunology, especially of infectious diseases, which has been carried out separately but imperfectly in each division; introduction and development of new technology are urgently required.	3. Immunology 3.1 To upgrade the capability to use the advanced immunological techniques.	3.1 To promote the research to solve the problems on the immunological phenomenon of infectious diseases and of human health.
4. Biological Products The responsibility of "development and control of biological products unit": Quality control of the biological products (domestic and imported), research to improve the products and to develop new biologicals.	4. Biological Products 4.1 To cooperate to perform the quality control and biological standardization of biological products locally produced and imported and to support EPI Programme.	4.1 To ensure the quality of biological product for safety and efficacy.
	4.2 To cooperate in the research on development of new biological products.	4.2 To produce the efficient new biological products.

Technical Cooperation Project		
The NIH activities	The project activities	Target to be acheived at NIH
	The main project activities are to support health promotion of the whole nation.	
	4.3 To raise the capability to study genetics for bacteria and virus and recombinant DNA technology.	4.3 To obtain the advanced knowledge and technology in the field of biological work.
5. Medical Entomology The responsibility of Division of Medical Entomology: Fundamental and applied research in medical entomology and related field: vector surveillance, ecology of vector, vector control, insecticide susceptibility of vectors. Works on rodent, flea and acari are also involved.	5. Midical Entomology 5.1 To cooperate to promote the study on the biology and ecology of vectors. 5.2 To advise on the study the suitable way to prevent and combat the outbreak of vector borne diseases.	5.1. 5.2 To prevent and control vector borne diseases.
6. Medicinal Plant The responsibility of "Medicinal Plant institute": Research of medicinal plants in Thailand with focus on confirming their medicinal effect and safety; cultivation of the	6. Medicinal Plant 6.1 To advise on the research on medicinal plant including cultivation, pharmacological and toxicological studies in experimental animals and clinical trials.	6.1 To produce and utilize the plant product obtained from the studies.

Technical Cooperation Project		
The NIH activities	The project activities	Target to be acheived at NIH
	The main project activities are to support health promotion of the whole nation.	
plants in experimental garden, physicochemical analysis of the active constituents, structure elucidation, pharmacological and toxicological research. Examples: anti-diabetic, cardiotonic, anti-helminth, anti-asthmatic, anti-malarial and anti-microbiological agents, toxicity study of the plants used in primary health care.		
7. Biomedical Research on food The responsibility of "biomedical research on food unit": Survey on the food contaminants causing by environmental pollution such as microorganisms and pesticide residues etc, study on toxicity of local food and actual intake by the people, mthodology development of qualitative analysis of food for use by local laboratories.	7. Biomedical research on food 7.1 To advise on method for analysis of food contaminants.	7.1 To control the quality of food distributed all over the country