

ABS Projects at Novartis – Bioprospecting for New Medical Treatments

9th Meeting of the Conference of the Parties

May 26, 2008

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Dimension of biological diversity

Terrestrial ecosystems

- **Mega-diversity regions:**
E.g. S. America, Australia,
Indonesia
- **Hotspots of diversity:**
Tropical rainforests: 4 % of
the land surface with 50 % of
all species on Earth

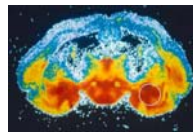
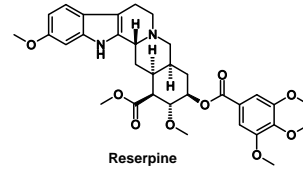
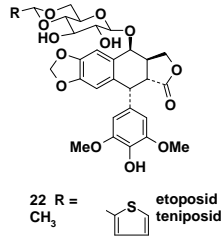
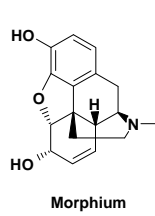
➤ ~ 150'000 natural products

Marine ecosystems

- **Highest degree of
biodiversity**
- **90 % of all organisms
classes**

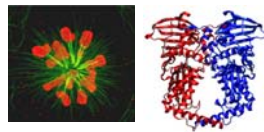
➤ ~ 15'000 natural products

Knowledge generation based on natural products for new medications



Opiate receptor

Pain



Spindle formation Topoisomerase II

Cancer



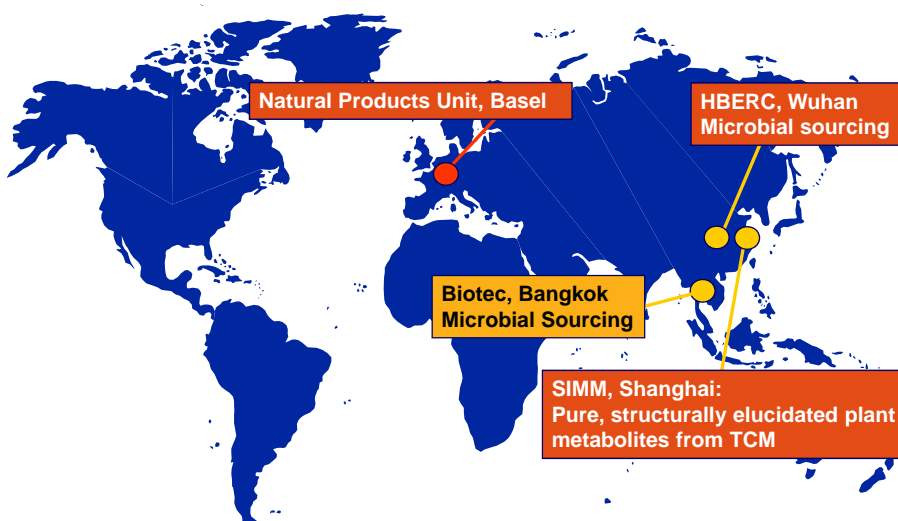
Dopamine biochemistry

Parkinson's Disease

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Shanghai Institute of Materia Medica, HBERC, Wuhan, Biotec, Bangkok



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Shanghai Institute of Materia Medica

Goals

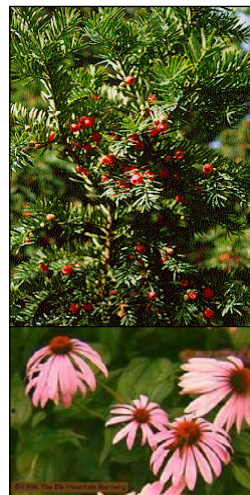
- Drug discovery with purified natural compounds from plants and fungi used in Traditional Chinese Medicine

Time

- Eight years collaboration (8. 2001 to 12. 2009)

Project management

- Joint Steering Committee
- Semi-annual meetings in Basel/ Shanghai



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Mutual benefits being shared

- **Know how transfer to SIMM**
 - Newest analytics and prep technologies
 - Modern electronic database systems
 - Scientist and techn training at Novartis and SIMM site
 - NP lectures by Novartis experts for students at SIMM and University of Shanghai
- **Financial Support to SIMM**
 - Equipment and running costs
 - Full training costs, visiting scientists of Novartis labs in Switzerland
 - Milestone payments, royalties
- **Research Progress**
 - Several fold increase of scientific publications since project start
 - Significant number of pure plant metabolites delivered to Novartis for in-house screening
 - First compounds in closer evaluation and development of licensing opportunities



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Collaboration with Hubei Biopesticide Engineering Research Centre, Wuhan

- Microbial sourcing project started January 1999
- First Chinese microbial sourcing partnership with Western Pharma Company
- Bacterial diversity guaranteed by sampling in various geographical and ecological areas
- Capacity build-up by technology transfer, education/ training at HBERC and at Novartis laboratories; supply of equipment and scientific advice
- In 2006, Chinese partner received significant financial support from Chinese government
- In the meantime, new co-operations with other international companies based on implemented Novartis technologies and know-how



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Biotec Research Center, Bangkok, Thailand

Novartis Pharma

Testing of samples in screening systems at Novartis

Financials, Know-how transfer; royalties

Submission of microbial samples, isolated natural products, or promising NP from Biotec screening

Biotec, Bangkok

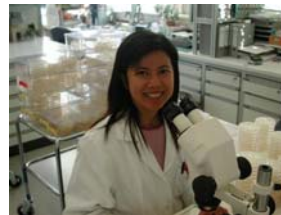
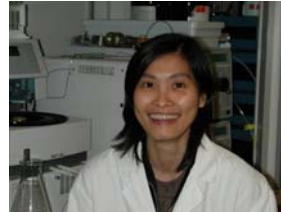
Isolation of microorganisms (bacteria and fungi) and of pure natural products
Screening samples for own research activities

Capacity building: Foster scientific strategy of Biotec to become a center of excellence for natural products research in SE Asia

Education: Finance internships of Biotec scientists visiting laboratories of natural products research and screening departments at Novartis Pharma

Biotec: Quick build-up of new microbial sourcing partnership

- Contract signed in March 2005; extension approved until May 2011
- Knowledge transfer: Three on-site training course/ lectures in Oct 05 and March 07
- So far 9 Biotec scientists trained in chemistry, microbiology, HTS at Nov Switzerland; full cost coverage by Novartis
- Capacity build up in microbiology, chemical profiling, and screening in Bangkok
- Dissemination of specific microbiology know-how to scientists from other SE Asian countries
- Advice in new strategy and introduction of new research concepts at Biotec
- > 3000 microbial strains delivered for drug discovery at Novartis



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Transparency - Tracking the origin of genetic resources in natural product research at Novartis

Registration of genetic material in databases

Strain or plant extract

Barcode or unique name
e.g. 1000851036

Registration in NP db NICE incl. country of origin & supplier

Sample	Results	Sample details	Result details
sample details			
Name	Type	Class	Medium
1000851036	STRAIN	FUNG	
Method			
Prompt			
Species	Value	Unit	
Taxonomic level 2	BEAUVERIA FELINA		
Taxonomic level 1	SORDARIOMYCETES		
Taxonomic level 1	ASCOMYCOTA		
Sample origin	REU		
Sample supplier	BTR		
Lab journal Nbr	E-31479		
Sequence region	ITS1F-ITS4		

Sample	Results	Sample details	Result details
Selected result details			
Name	Medium		
Value/ID/UID	MPSG-00.00		
Method			
MANCULT			
Prompt			
Cultivation temperature	22		
Cultivation duration	5 D		
Cultivation flask	PS2		
Media group	A		
Effective harvest date	19-06-2002		
Cultivation start date	13-06-2002		
Cultivation media volume	50.00		

Cultivation and Extraction:
Data stored in NP db NICE

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Transparency - Tracking the origin of genetic resources in natural product research at Novartis

Registration of results connected to material in databases

Isolation of pure compounds



Unique compound code



Registration in central chemical db WITCH, incl. reference to source and in NP db NICE

Available	Amount	Lab Location
1	g	
2	g	



Biological activities of compound stored in db Pharon/Avalon

Thank You

