



## **Trans-Pacific Partnering & Licensing Opportunities & Trends**

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## Some Challenges For The Industry

- R&D productivity – 19 novel therapies approved by U.S. FDA in 2007 – lowest since 1983.
- R&D costs – Estimated \$1.2 billion to bring a biopharmaceutical to market (Tufts CSDD – 2006 study)
- Key compounds coming off-patent
  - 2007 = Ambien, Lamisil, Norvasc, Protonix.
  - 2008 = Fosamax, Imitrex, Lamictal, Risperdal
  - 2009 = Aciphex, Prevacid, Topamax, Valtrex
  - 2010 = Flomax
  - 2011 = Actos, Aricept, Effexor XR, Levaquin, Lipitor, Zyprexa
  - 2012 = Avandia, Crestor, Diovan, Lexapro, Plavix, Seroquel, Singulair
- Biosimilars on the horizon?
- Increasing price pressures

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## What Our Reporters Are Hearing About Asia – Opportunities

- Outsourcing to capitalize on greater productivity – R&D, manufacturing
- New R&D business models – multiple networks/partnerships (FIPNet) may be replacing traditional FIPCO model
- Clinical trials – faster enrollment, higher patient concentration, cost savings, ethnic differences in global trials
- Talent pool – PhDs in India, China, etc.
- Large economies with growing middle class – China predicted to be 5<sup>th</sup> largest pharma market by 2010 (Boston Consulting Group)
- Global financial crisis could speed up big pharma R&D expansion into Asia

## Bricks & Mortars AND Virtual Networks

- “We believe in setting up a virtual drug-discovery relationship rather than bricks and mortar in Asia. ... Working with local partners, especially in China and India, is a better way to go.”  
*- Merck Director of Worldwide Licensing & External Relationships Bharatt Chowrira (PharmAsia News 3/6/08)*
- “The culture and the specifics are different than in the U.S. and in Europe. And my conviction is you can't learn without getting wet. That is, the best way to get into the mindset, to understand the local science, talent and the needs also of the patients, is by actually doing research here.”  
*- Novartis Head of Corporate Research Paul Herrling, discussing his firm's China R&D center, which broke ground on its permanent headquarters in Shanghai April 2 (PharmAsia News 5/5/08)*

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**With Takeda/MLMN, 2008 YTD Passes Five-Year High Set in 2004 in M&A Dollars Spent by Asian Pharma Acquirers**

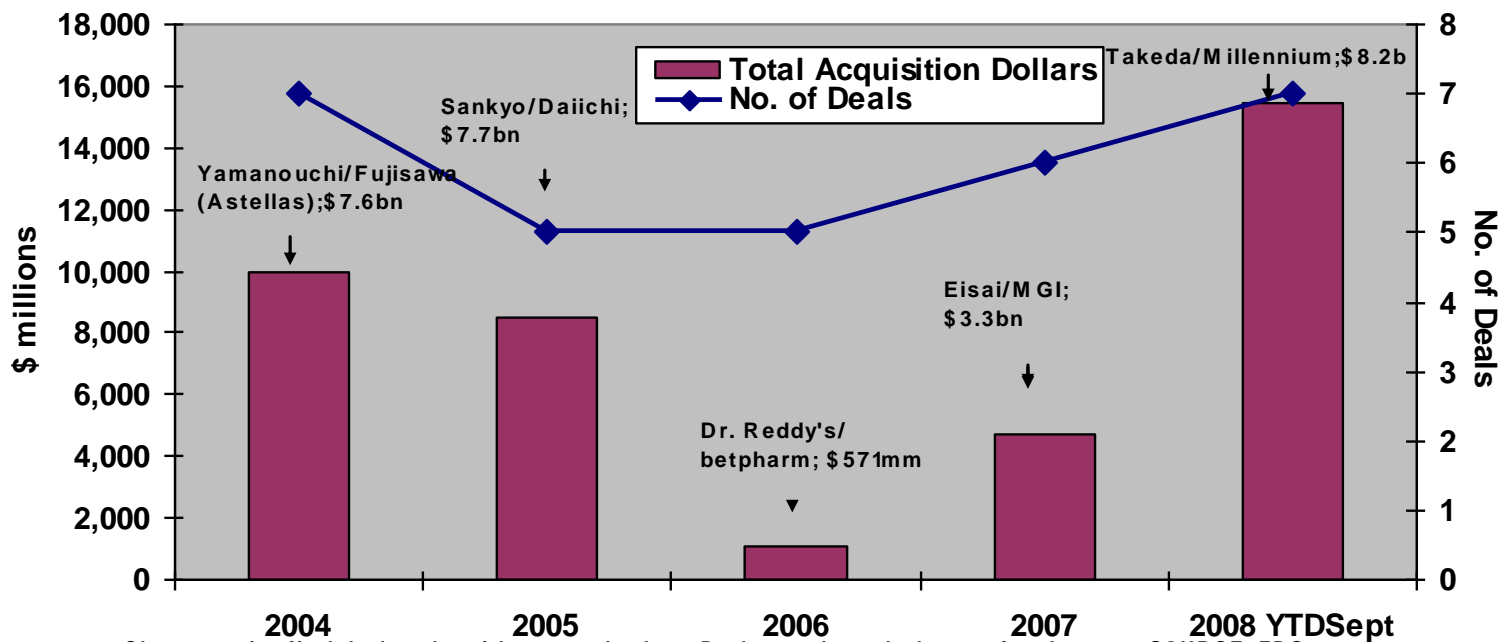


Chart contains final deals only, with reported values. Deals noted are the largest for that year. SOURCE: FDC-Windhover's *Strategic Transactions*.

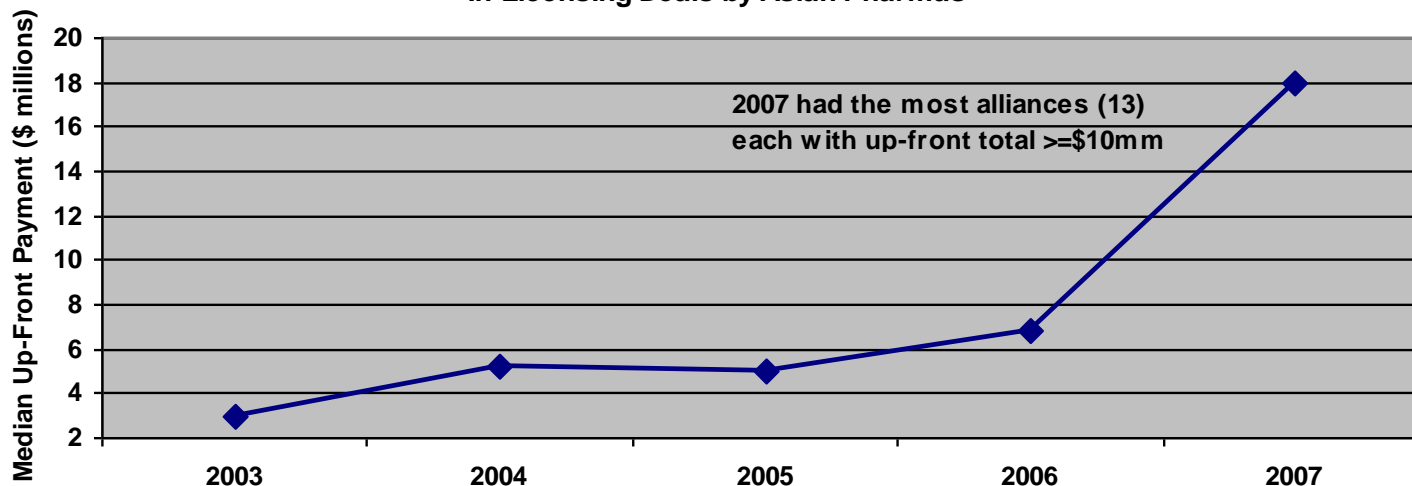
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**Top Ten Acquisitions by Asian Pharmaceutical Companies, 2003-YTD September 2008**

Date	Acquirer	Acquired (products/business)	Potential Deal Value (\$mm)
Apr 2008	Takeda Pharmaceutical Co. Ltd.	Millennium Pharmaceuticals Inc. (multiple myeloma drug <i>Velcade</i> (bortezomib) plus drug candidates for GI and inflammatory diseases)	8,168
Feb 2005	Sankyo	Daiichi (drugs for infectious diseases, cancer, CNS disorders, and gastrointestinal conditions)	7,749
Feb 2004	Yamanouchi	Fujisawa (immune-related therapeutics) *combined co. now called Astellas	7,638
Jun 2008	Daiichi Sankyo	Ranbaxy (generics)	3,783
Dec 2007	Eisai	MGI Pharma (cancer and acute care products)	3,332
Nov 2004	Dainippon Pharmaceutical	Sumitomo Pharmaceuticals (high blood pressure drug <i>Amlodin</i> and antibiotic <i>Meropen</i> )	2,168
Oct 2008	Kirin Pharma/Kyowa Hakko Kogyo	Merger created new entity called Kyowa Hakko Kirin Co. Ltd.	1,462
Sept 2008	Shionogi	Sciele (therapeutics for women's and children's health, cardiovascular disease, and diabetes)	1,424
Feb 2006	Dr. Reddy's Laboratories	betapharm (generics)	571
Nov 2007	Astellas	Agensys ( <i>XenoMouse</i> technology for discovery of cancer monoclonal antibodies)	537

# Trans-Pacific Partnering & Licensing Opportunities & Trends

**Up-Front Payments Growing  
In-Licensing Deals by Asian Pharmas**



Includes only deals with known up-front values. SOURCE: FDC-Windhover's *Strategic Transactions*.

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## Top Ten In-licensing Deals by Asian Pharmaceutical Companies, 2003-YTD September 2008

Date	Licensee	Licensee	Product/Candidate	Potential Deal Value (\$ millions)*
Apr 2006	Astellas	FibroGen	Several oral hypoxia-inducible factor (HIF) prolyl hydroxylase (PH) inhibitors in early clinical development for anemia	815
Apr 2008	Astellas	CoMentis	Phase I Alzheimer's disease candidate CTS21166 plus others in CoMentis' beta-secretase inhibitor program	760
Feb 2008	Takeda	Amgen	13 clinical compounds including Phase III angiogenesis inhibitor motesanib (AMG706) for various cancers	640
Jun 2006	Takeda	Affymax	Phase II <i>Hematide</i> for anemia	385
Sept 2007	Takeda	H. Lundbeck	Phase II Lu AA21004 and Phase I Lu AA24530, both for depression; and other early-stage neurology projects	385
Mar 2004	Eisai	Elan	Anticonvulsant <i>Zonegran</i> (Elan originally had rights from Dainippon)	266
Jun 2007	Lion	BMS	<i>Bufferin</i> and <i>Excedrin</i> nonprescription pain relievers	250
Nov 2005	Astellas	Theravance	Phase III Telavancin lipoglycopeptide injectable antibiotic for gram-positive infections	221
Nov 2004	Takeda	Sucampo	Lubiprostone (SPI-0211) for chronic constipation (Phase III) and constipation-predominant irritable bowel syndrome (Phase II)	210
Dec 2007	Otsuka	PDL BioPharma	<i>IV Busulfex</i> (busulfan) oncology product	200

\*Potential Deal Value is the sum of up-front fees plus pre-commercialization money. SOURCE: FDC-Windhover's Strategic Transactions

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