



Drug Discovery at UC Campuses

Is there a Common Vision?

Impact of public sector research on pharmaceutical industry

<u>Discovering Institution</u>	<u>Number</u>	<u>Current Marketer</u>	<u>Number</u>
National Institutes of Health	22	GlaxoSmithKline	12
U. of California	11	J&J	9
Sloan Kettering	8	Bristol-Myers Squibb	8
Emory University	7	Merck	8
Yale University	6	Pfizer	8
Children's Hospital, Boston	5	Eli Lilly	6
MIT	5	Genzyme	6
Salk Institute	5	Novartis	6
Wisconsin Alumni Research Foundation	5	AstraZeneca	5
Columbia University	4	Wyeth	5
New York University	4	Amgen	4
U. of Michigan	4	Bayer Healthcare	4
U. of Minnesota	4	Eisai	4
U. of Texas	4	Roche	3
		Abbott	3
		Baxter Healthcare	3
		BiogenIdec	3

From *The Contribution of Public Sector Research to the Discovery of New Drugs*, A.Stevens et al, Boston University, 2009

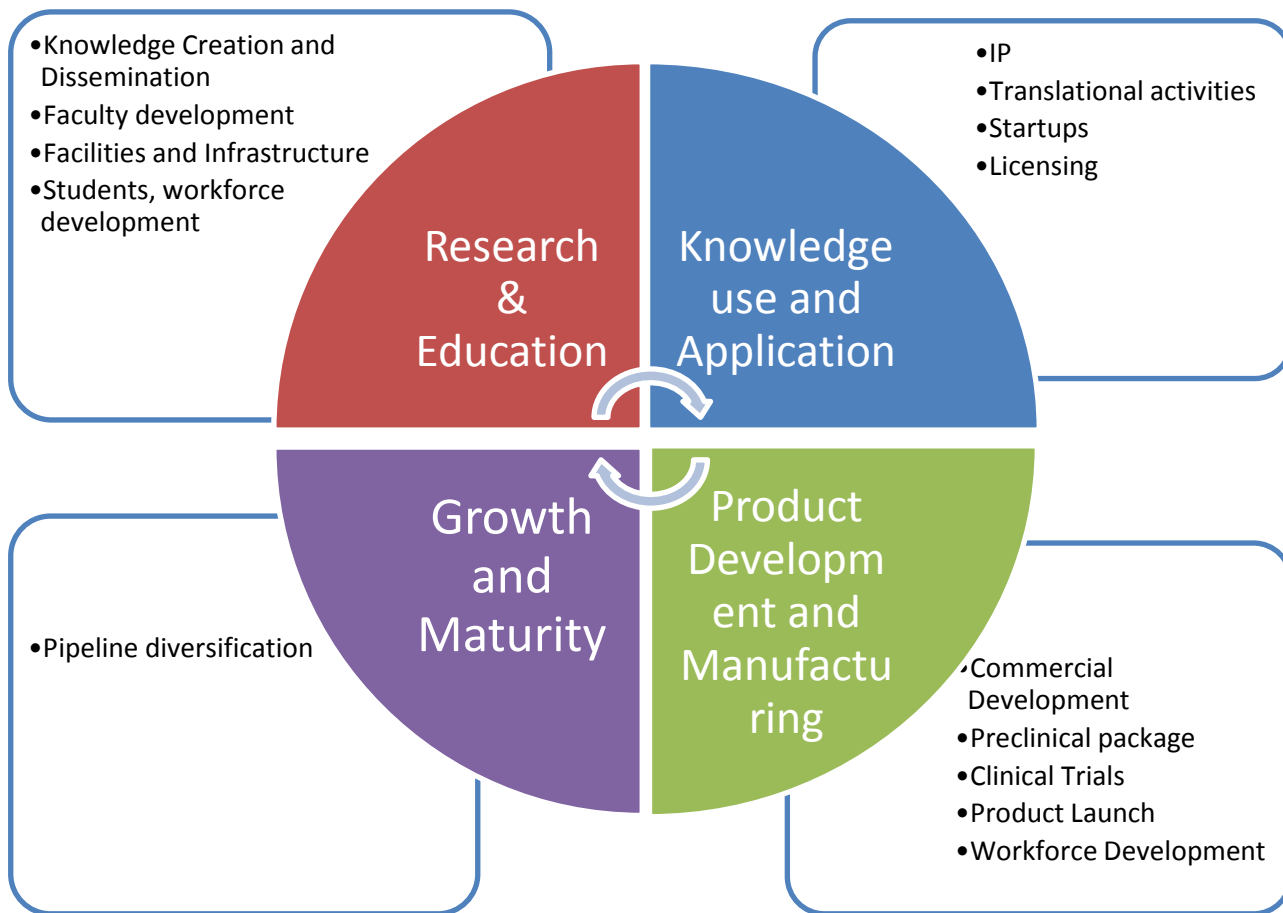
Impact of public sector research on pharmaceutical industry

□ 2008 US Sales	\$36.9 billion
□ 21 products no longer sold	
□ >\$1 billion	13
□ >\$2 billion	4
□ >\$3 billion	2

Source: IMS Health

From *The Contribution of Public Sector Research to the Discovery of New Drugs*, A.Stevens et al, Boston University, 2009

Innovation Ecosystem: Drug Discovery and Development

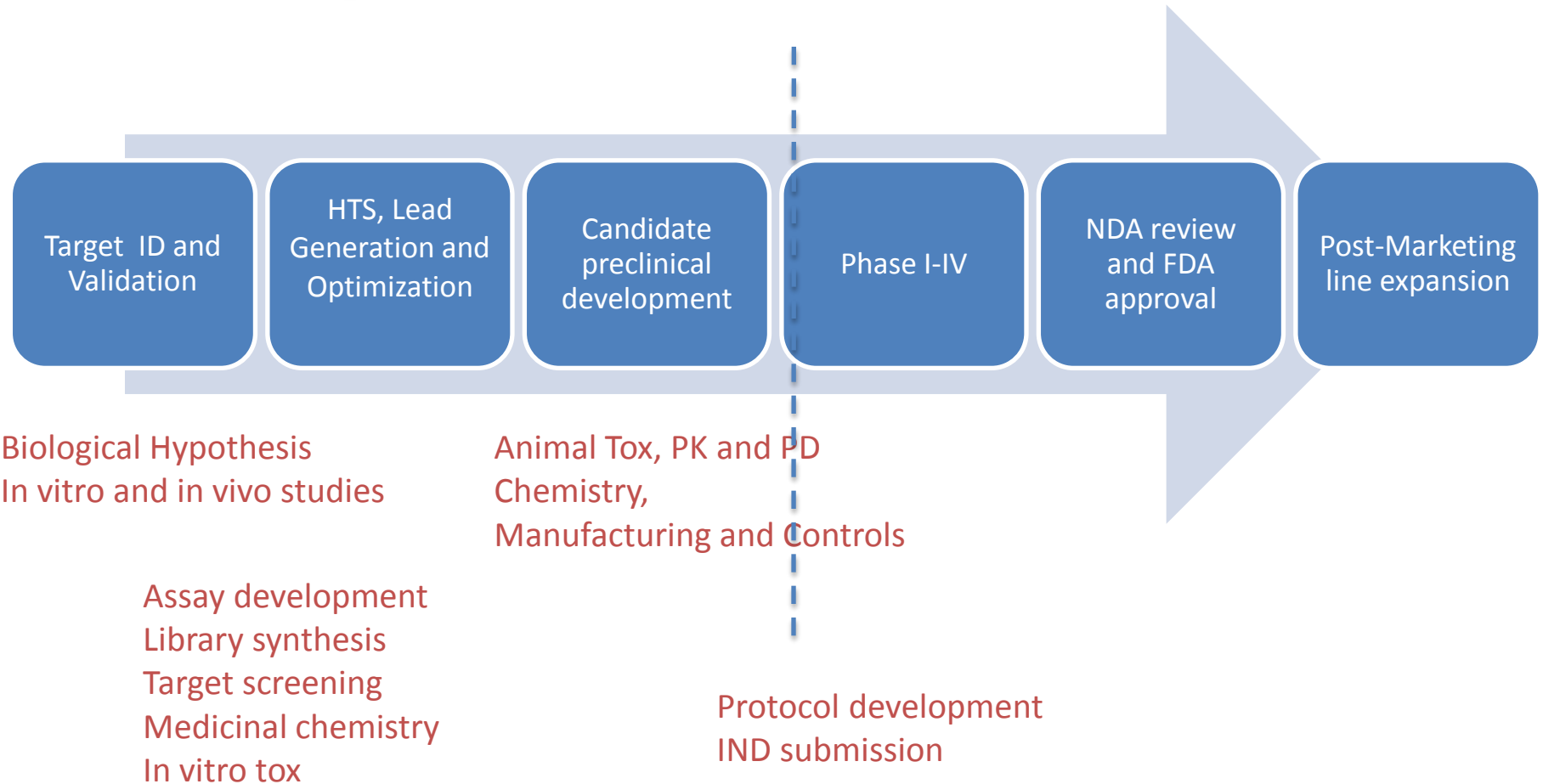


Adapted from A. Pradhan "Technology Transfer: building and maintaining relations with Industry"

Opportunities for UC collaboration

- **On all levels of Innovation Ecosystem, such as:**
 - Sharing education and workforce development
 - Complementary facilities and infrastructure
 - Collaborative translational activities
 - Master Research/CT agreements
 - Linking EMR
 - Multicenter Clinical Trials
 - Disease Consortia

Drug Development Process



Example of Academic Drug Development

- **Allopregnanolone for treatment of TBI**
- **174 patients, single center trial**
- **\$7.7M DOD Award**
- **\$1.73 /2 years**
- **Pre-IND and IND submitted**
 - 350 pages
- **Subcontractors & Consultants**
 - Scientific/Clinical
 - Regulatory
 - Manufacturing
 - Formulation
 - Biostat
 - Clinical Monitoring
- **Pre-clinical tox or efficacy was not required (published lit)**

Example of UC Collaboration: complementary facilities and resources



Multiple Genomics, Proteomics
and Metabolomics screening
facilities

Animal Models of Disease

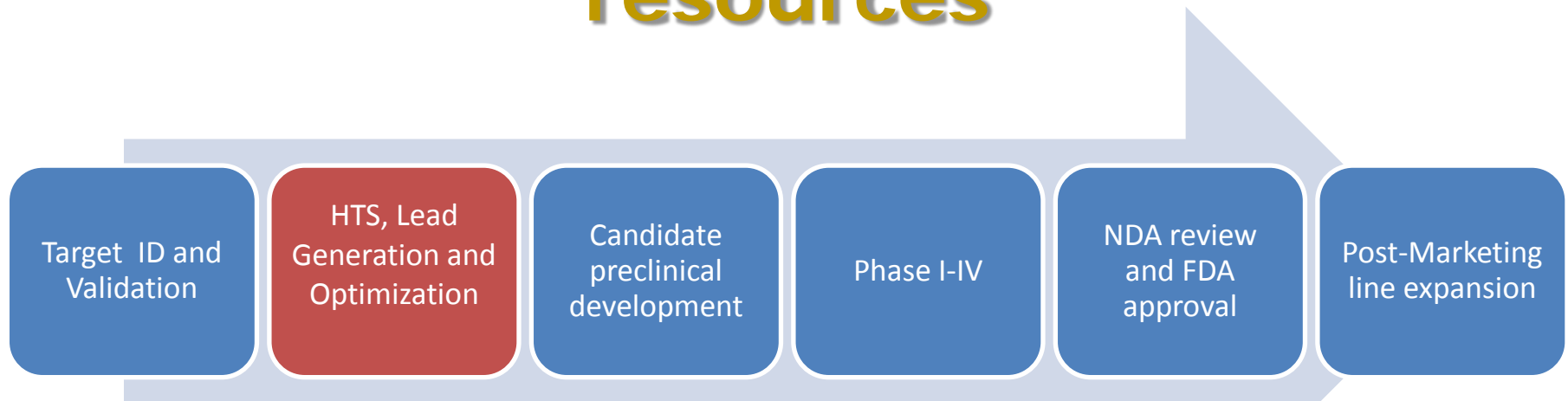
Tissue Banks

Imaging Facilities

Some Cool Stuff:

- Primate Center (UC Davis)
- Crump Institute for Molecular Imaging (UCLA)
- Beckman Laser Center (UCI)
- Stem Cells (UC Davis, UCSF)
- DXMS Proteomic Resource (UCSD)

Example of UC Collaboration: complementary facilities and resources

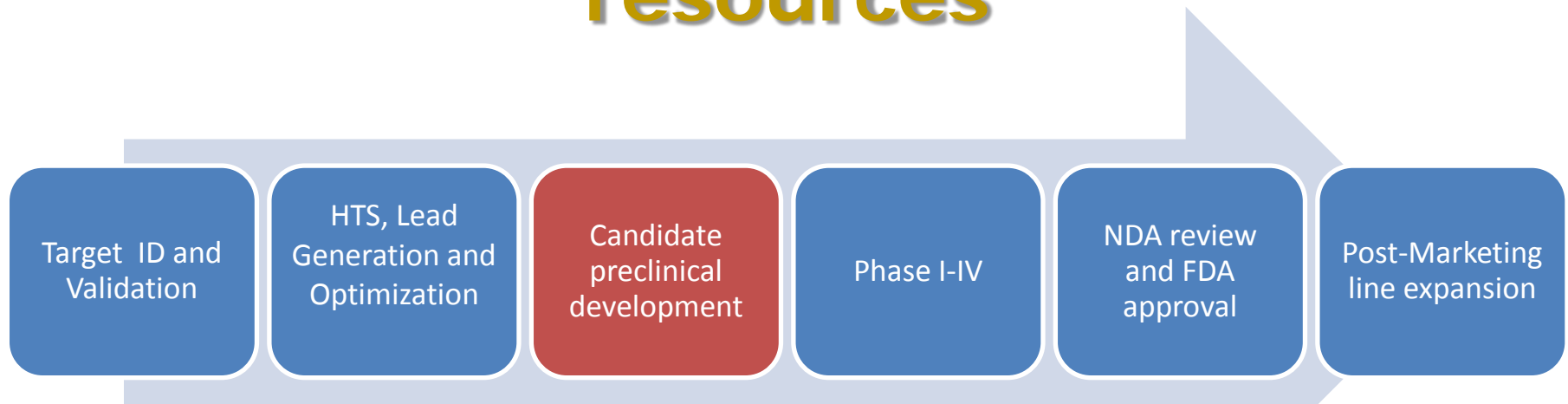


Chemical Libraries
Med Chem

Some Cool Stuff:

- SiRNA of druggable genomes at Molecular Screening Shared Resource (UCLA)
- Small Molecules Discovery Center (UCSF), incl. Med Chem capabilities
- OBOC screening (UC Davis)
- Cal Nansystems Institute (Drug delivery –UCLA)
- Natural Product Libraries(UCSD)
- Computer-aided DD group (UCSD)
- Structural and Medicinal Chem database (UCSD)

Example of UC Collaboration: complementary facilities and resources

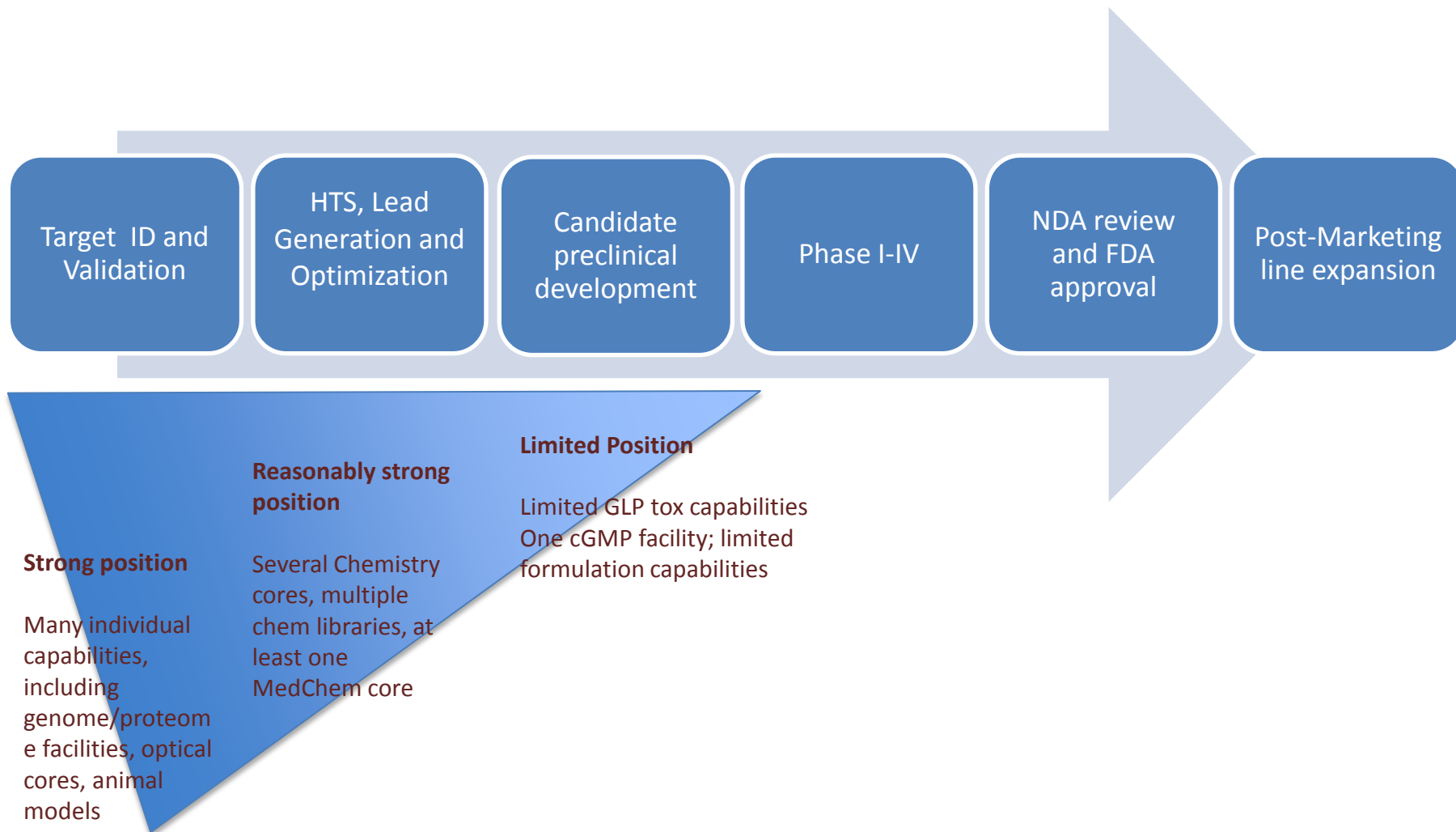


Animal ADME/TOX
In vitro tox screens
Large-scale chemical and
biological synthesis

Some Cool Stuff:

- cGMP facility (UC Davis) – production of phase I-II quantities of small molecules, cellular therapies and biologics
- GLP Tox infrastructure at Animal Care Program (UCSD)

Summary: complementary facilities and resources



UC Opportunities for Collaboration in Drug Discovery and Development

- **Strong position in target id and validation**
 - Typical academic strength
 - Catalogue and make known the available resources (especially Animal Models) (Susan Old)
 - Disease-specific teams

UC Opportunities for Collaboration in Drug Discovery and Development

- **Reasonable position in small molecule screening and assay development**
 - Streamlining the mechanisms for collaboration
 - Catalogue and make known the available resources (what compounds are available, especially unique)
 - Sharing and integrating libraries and capabilities
 - One point person from each screening center
 - IP issues in Med Chem
 - Commercial vendors (outsourcing); preferred pricing
 - Academic Med Chem coaches and project managers
 - One coordinating center for UCs

UC Opportunities for Collaboration in Drug Discovery and Development

- **Limited position in Preclinical Development**
 - Two cGMP facility (UC Davis, UCLA) is enough to supply the system
 - One GLP tox program (UCSD) potentially enough, infrastructure need to be expanded
 - Explore outsourcing capabilities for ADME and Tox
 - Commercial vendors vs academic coaches
 - One UC coordinating center
 - Limited funding available for these studies

Action Items

- **Explore NIH list of animal models (Susan Old)**
- **Funding individuals from each UC to catalog animal models**
- **One point person from each screening center to catalog and define potential shared resources**
- **Review MedChem outsourcing (UCSF)**
- **Review ADME/TOX outsourcing (UCSF)**