Metabolic profiling unravels complex biological phenomena in the model plant *A. thaliana*

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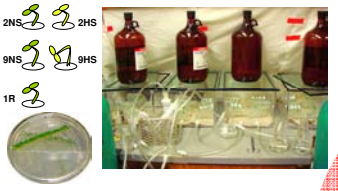
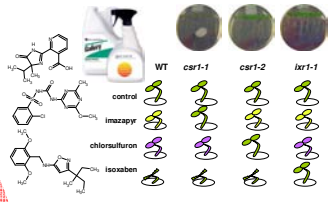
Environmental Stress: Hypoxia

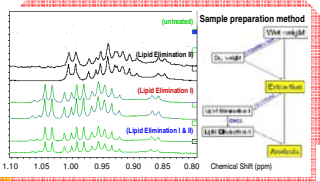


Metabolic Profiling

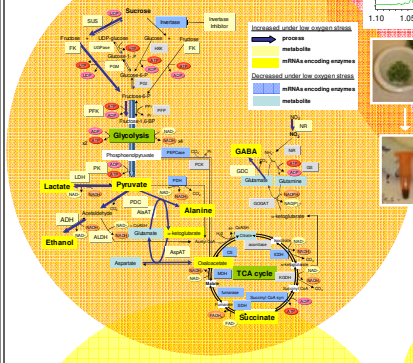
Chemical Stress: Herbicides



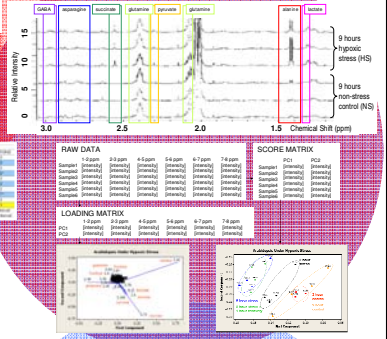
Chemistry



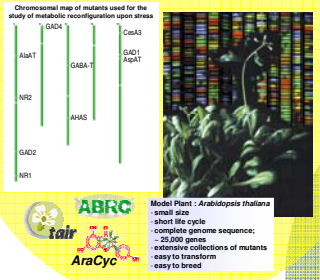
Biochemistry



Multivariate Statistics

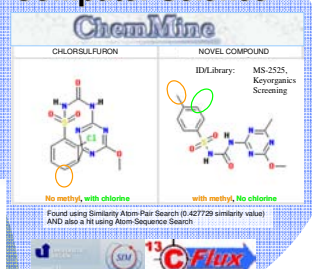


Plant Biology

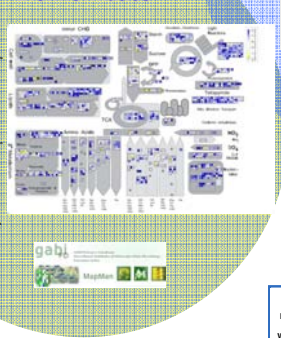


Chemistry / Biochemistry & chemical biology / Modeling & statistical analyses / Metabolic Profiling / Cell, Molecular & Developmental Biology / Genetics / Plant Biology / Genomics & Bioinformatics / Computer Science & Engineering

Computer Science



Bioinformatics



References

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ChemMine: Girke, et al. *Plant Physiol.* (2005) 138, 573-577.
Hypoxic Stress: Branco-Price, et al. *Plant J.* (2008) submitted.
Metabolic Profiling: Kaiser, et al. NMR Spectroscopy in Pharmaceutical Analysis, Ed. Holtzgrabe, et al. (2008) in press.

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3rd Annual UC Riverside IGERT Retreat Nov 2-4, 2007 Warner Springs Ranch, CA

ChemGen DGE0504249 IGERT

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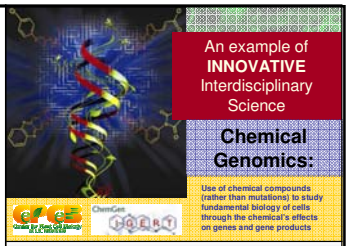


Chemical Libraries

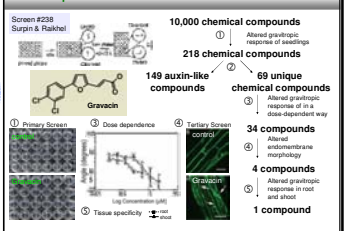
ChemBridge DiverSet: 20,000 compounds
ChemBridge Microformat: 10,000 compounds
ChemBridge NovaCore: 10,000 compounds
Microsource Spectrum collection: 2,000 compounds
Sigma/TimTec MyriaScreen: 10,000 compounds

Value ~ $100,000

Facilities and Support Staff

Microscopy and Imaging, Dr. David Carter
5 confocal microscopes, other imaging instruments
Bioinformatics, Dr. Thomas Girke
64-CPU Linux cluster, 4 quad core Mac Pro, 8 large servers, 1 Silicon Graphics (SGI)
Proteomics, Dr. Songquin Pan
3 mass spectrometers
Genomics Facility, Dr. Glenn Hicks
3 robots, DNA sequencer, 2 arrayer machines, 5 scanners, Affymetrix hard- and software, 2 qPCR cyclers, FACS cell sorter
Analytical Facility, Dr. Cynthia Larive
5 mass spectrometers, 2 x-ray diffraction systems, 5 magnets for NMR, 1 EPR, 2 FT-IR, 2 Raman spectrometers, 1 fluorescence spectrometer, 1 polarimeter

Example: Chemical Genomics "Screen"



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Rojas-Pierce, et al. "PGP Is a Target of Gravacin" *Chem. Biol.* (2007) 14, 1366-76.

ChemGen IGERT Projects

IGERT Student	GP	Project Description
SAMER ELKASHEF	GGB	Screen for inhibitors of plant proteins that respond to viral infection
CHARLES JANG	GGB	Screen for inhibitors of MPK3/6 (cellular signal transducers)
JAMES KIM	CMDB	Screen for compounds that affect G-protein coupled receptors
COLLEEN KNOTH	PB	Screen for elicitors of pathogen defense responses within a plant
CHRIS MERRYWELL	C	Screen for disruptors of protein trafficking
EDDIE CAO	CS	Virtual screen using compound similarity searching algorithms
JOLENE DIEDRICH	C	Screen for compounds that alter protein phosphorylation status
THERESA DINH	PB	Screen compounds that disrupt transcriptional gene silencing
KAYLA KAISER	C	Screen for inhibitors of amino acid biosynthesis (herbicides)
AUGUSTA JAMIN	GGB	Screen for inhibitors of ROP/RopGAP interaction (cell signaling)
SEAN BOYLE	GGB	Virtual screen of lead compound DAQ B1 analog library
MICHELLE BROWN	GGB	Screen for inhibitors of tobacco pollen tube germination
ANNA CHARISI	GGB	Virtual screen based on physicochemical properties of compounds
ANDREW DEFRIES	PB	Screen for modulators of protein-protein interactions
MELINDA SALUS	PB	Screen for elicitors of JA & ethylene dependent defense pathways
MELISSA SMITH	PB	Screen for LAP-A inhibitor & elicitors (JA dependent defenses)

GGB = Genetics, Genomics and Bioinformatics CMDB = Cell, Molecular & Developmental Biology
PB = Plant Biology C = Chemistry CS = Computer Science **[GP = Graduate Program]**