



Access to Synthetic Chemistry Can Expand the Services Offered by Your Core Facilities

DATE: October 13, 2023

PRESENTED BY: Aaron Nilsen, Director, OHSU Medicinal Chemistry Core

Medicinal Chemistry Core



The core's mission is to help researchers investigate the interactions between small molecules / peptides and biological systems by providing medicinal chemistry and chemical biology expertise and organic and peptide synthesis support.



Tapasree Banerji
Associate Director
for Instrumentation



Jordan Devereaux
Core Scientist



Victoria Halls
Core Scientist



Med Chem Core synthesizes small molecules and peptides.

Peptides/Proteins

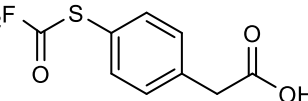
Kirsten Lampi and
Larry David

γ S 1-15 Crystallin thioester

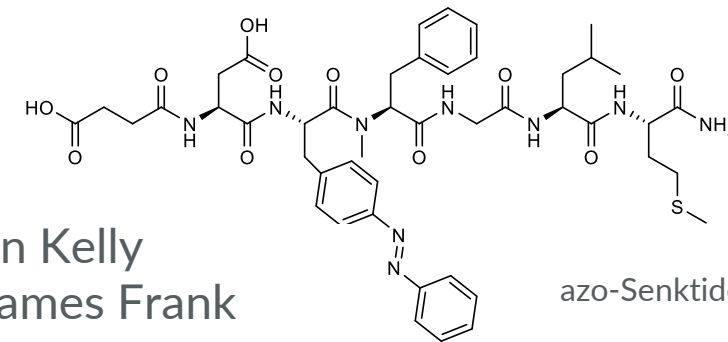
SKTGTKITFYEX₁KX₂F

X₁ = D, isoD

X₂ = N, D, isoD



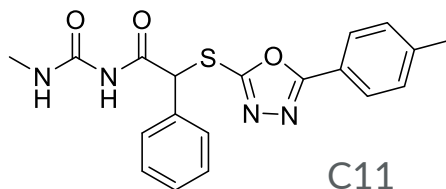
Martin Kelly
and James Frank



azo-Senkide-1

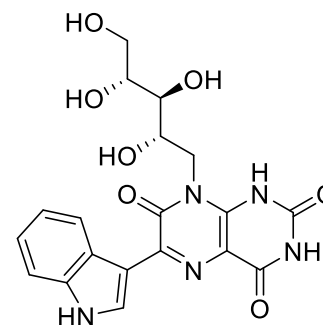
Small Molecules

Victor DeFilippis



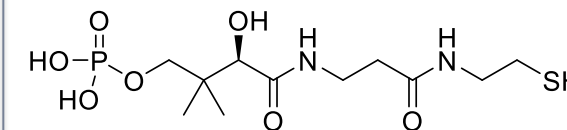
C11

David Lewinsohn
and Melanie Harriff



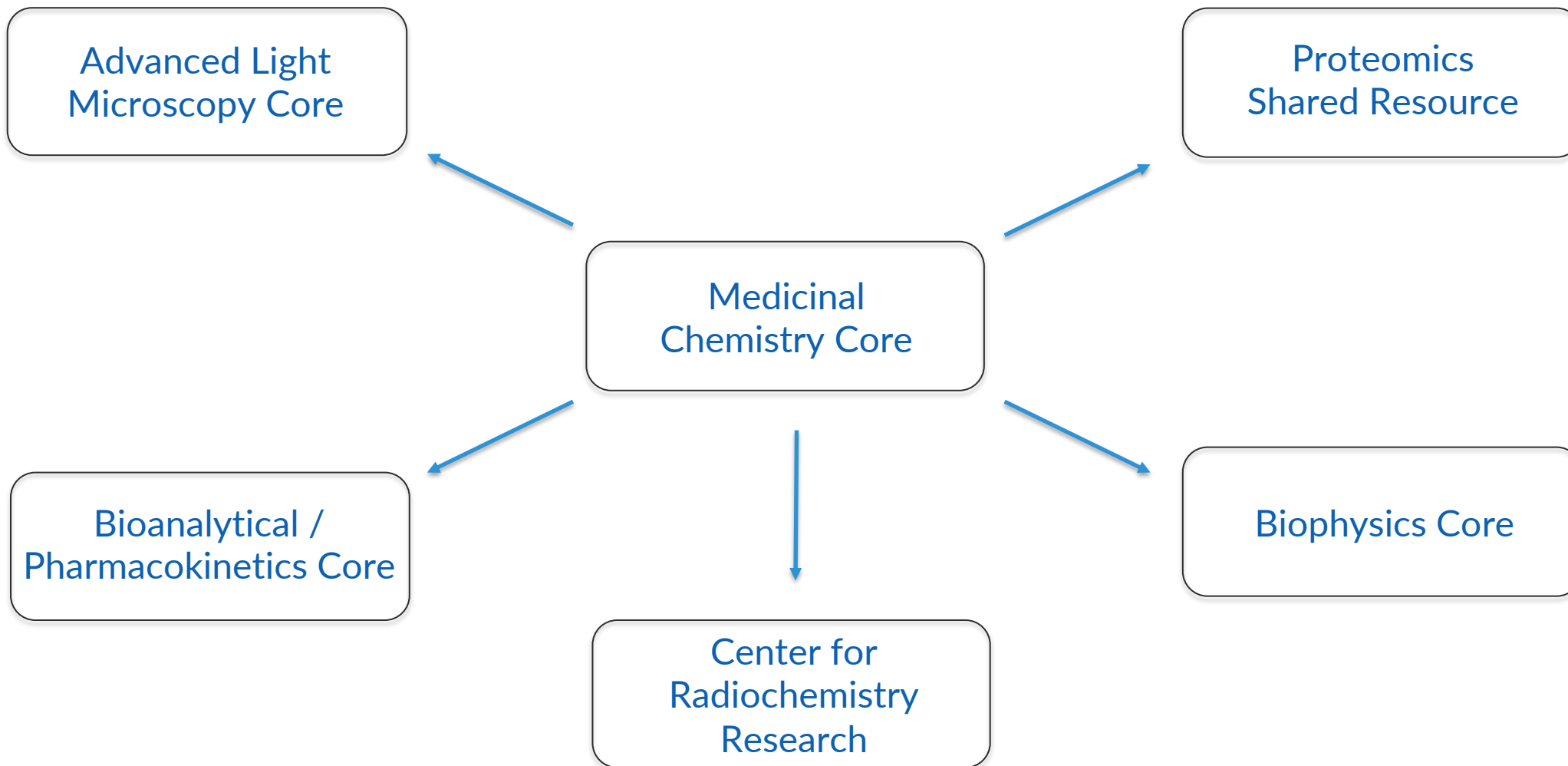
Photolumazine-III

Susan Hayflick and
Penelope Hogarth

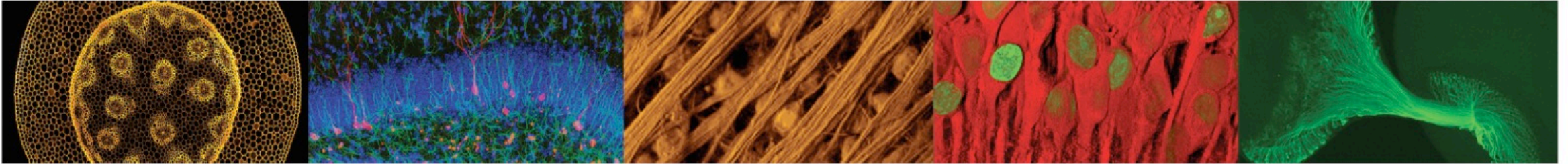


4'-phosphopanthetheine

Synthetic chemistry supports work in other cores.



Advanced Light Microscopy Core

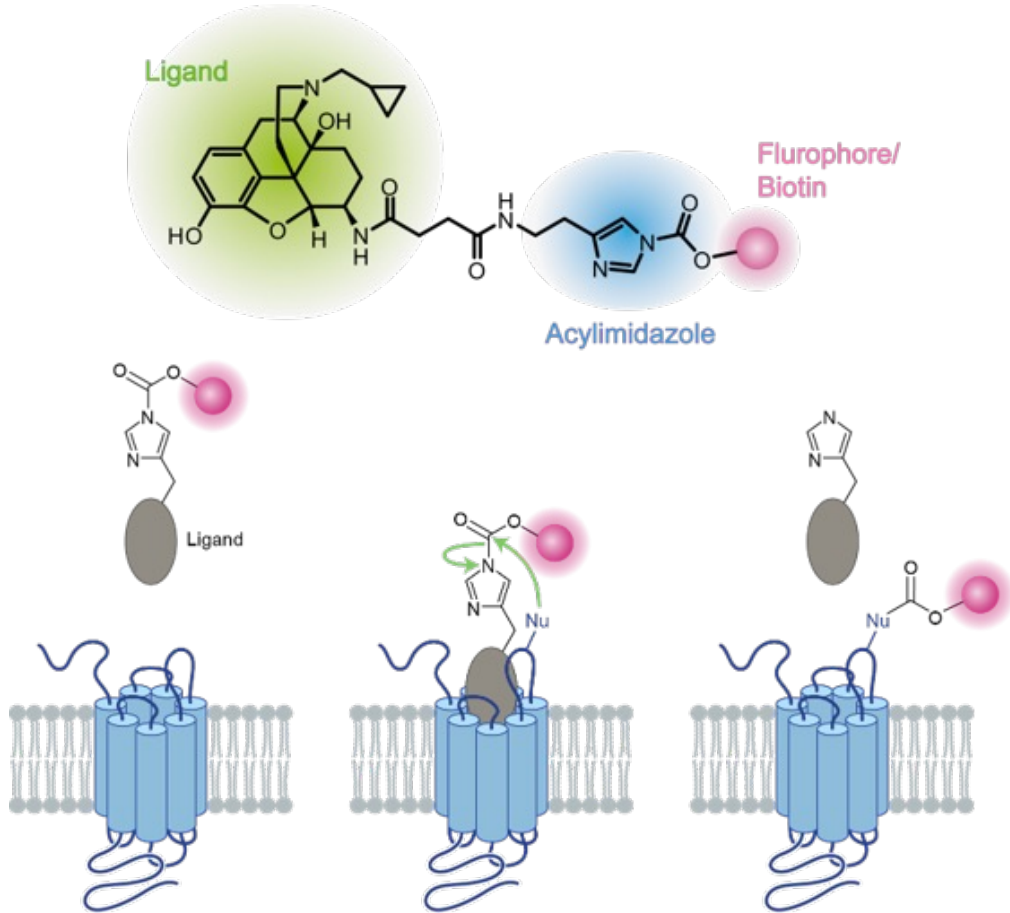


The Advanced Light Microscopy Core @The Jungers Center offers researchers at OHSU access to a wide variety of high-end light microscopes and, equally important, expert advice and guidance with modern technologies in fluorescence microscopy.



Stefanie Kaech Petrie
Director

Ligand-Directed Covalent Labeling of Membrane-Bound Receptors



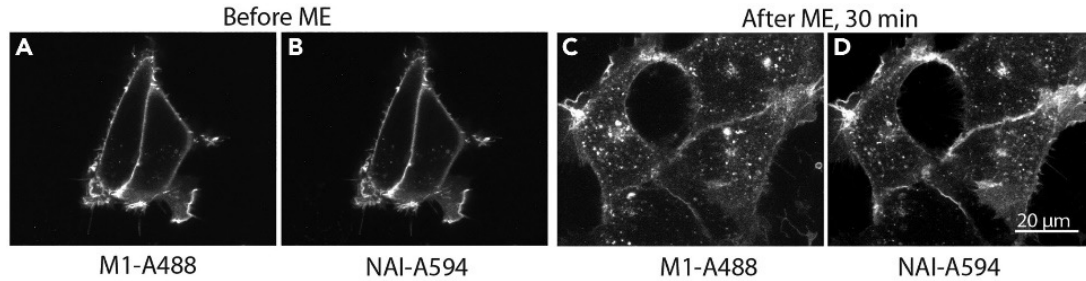
A ligand is modified with an acyl imidazole and a tag of choice.

Modified ligand interacts with target protein and transfers tag to the protein.

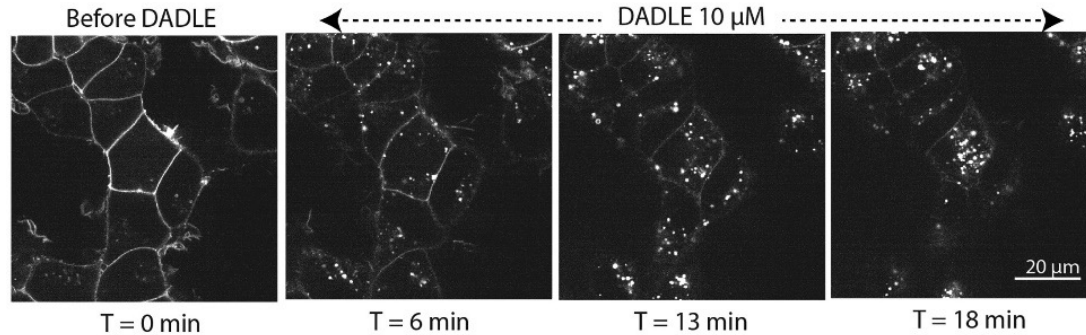
Can enable e.g. visualization of membrane receptors in cells or live tissue.

Labelled receptors can be visualized using light microscopy.

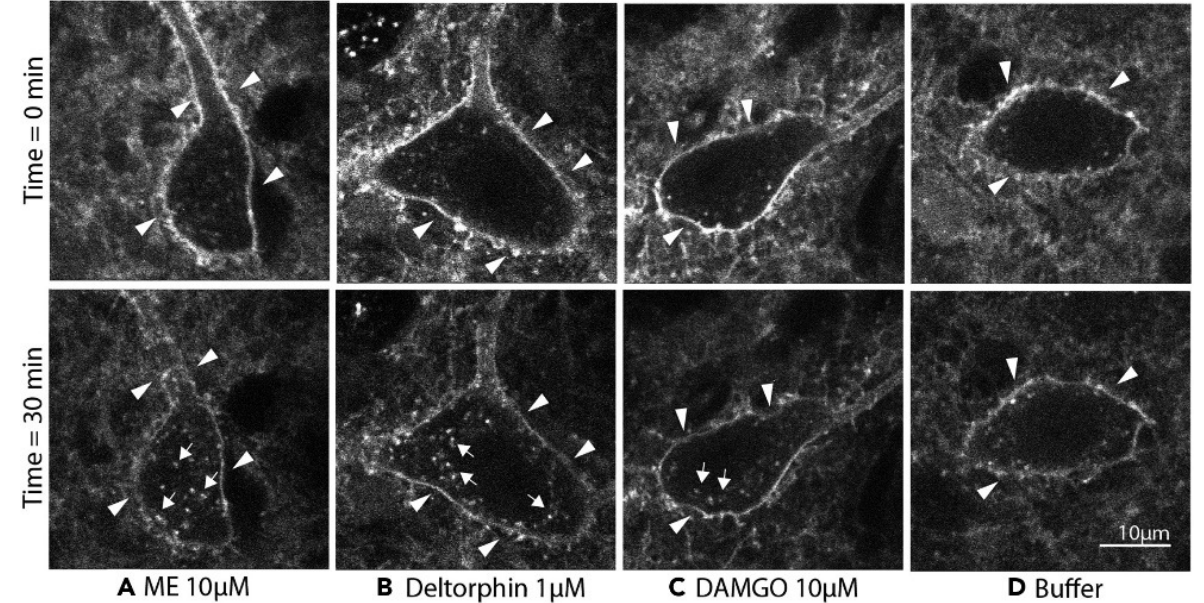
A Internalization of NAI-A594 labeled FMOR in HEK293 cells



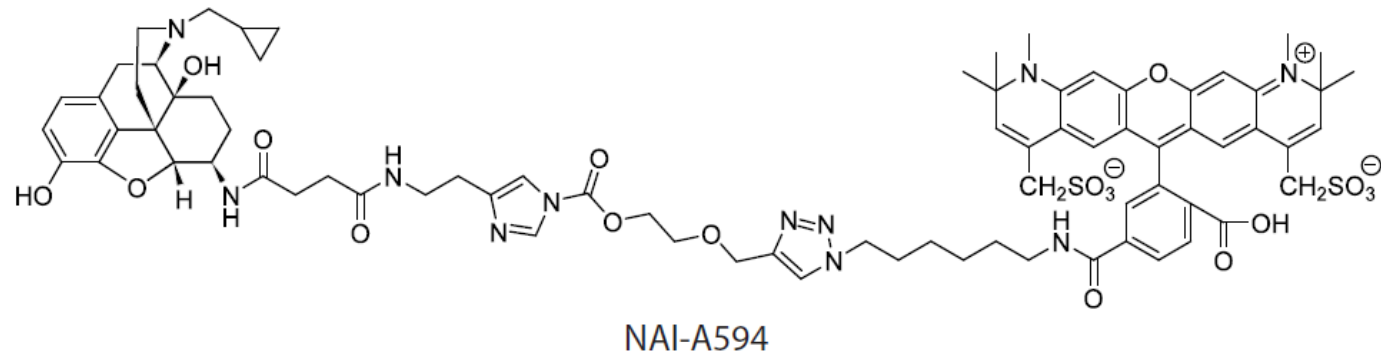
B Internalization of NAI-A488 labeled FDOR in HEK293 cells



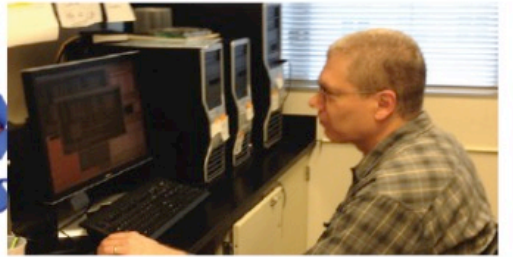
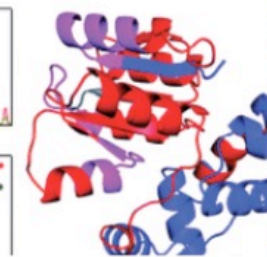
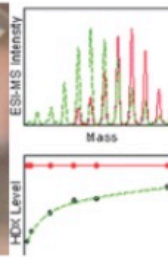
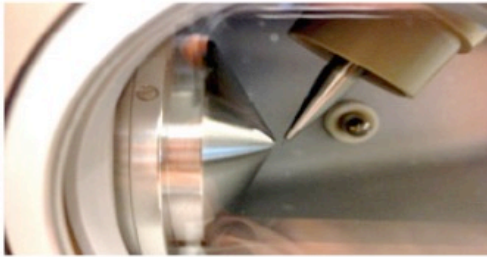
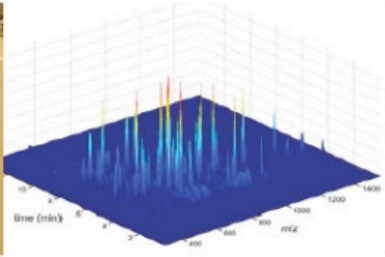
c Internalization of endogenous MOR and DOR in brain slices



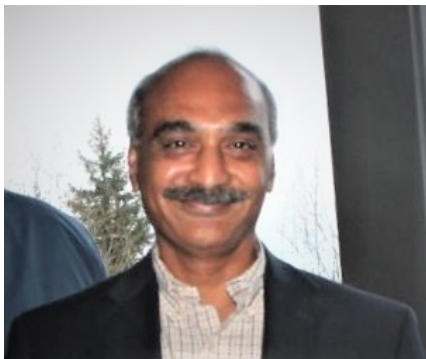
Adoff, Halls, Holland, Lobingier, Arttamangkul, STAR Procols 4, 102231, PMID: 37104097.



Proteomics

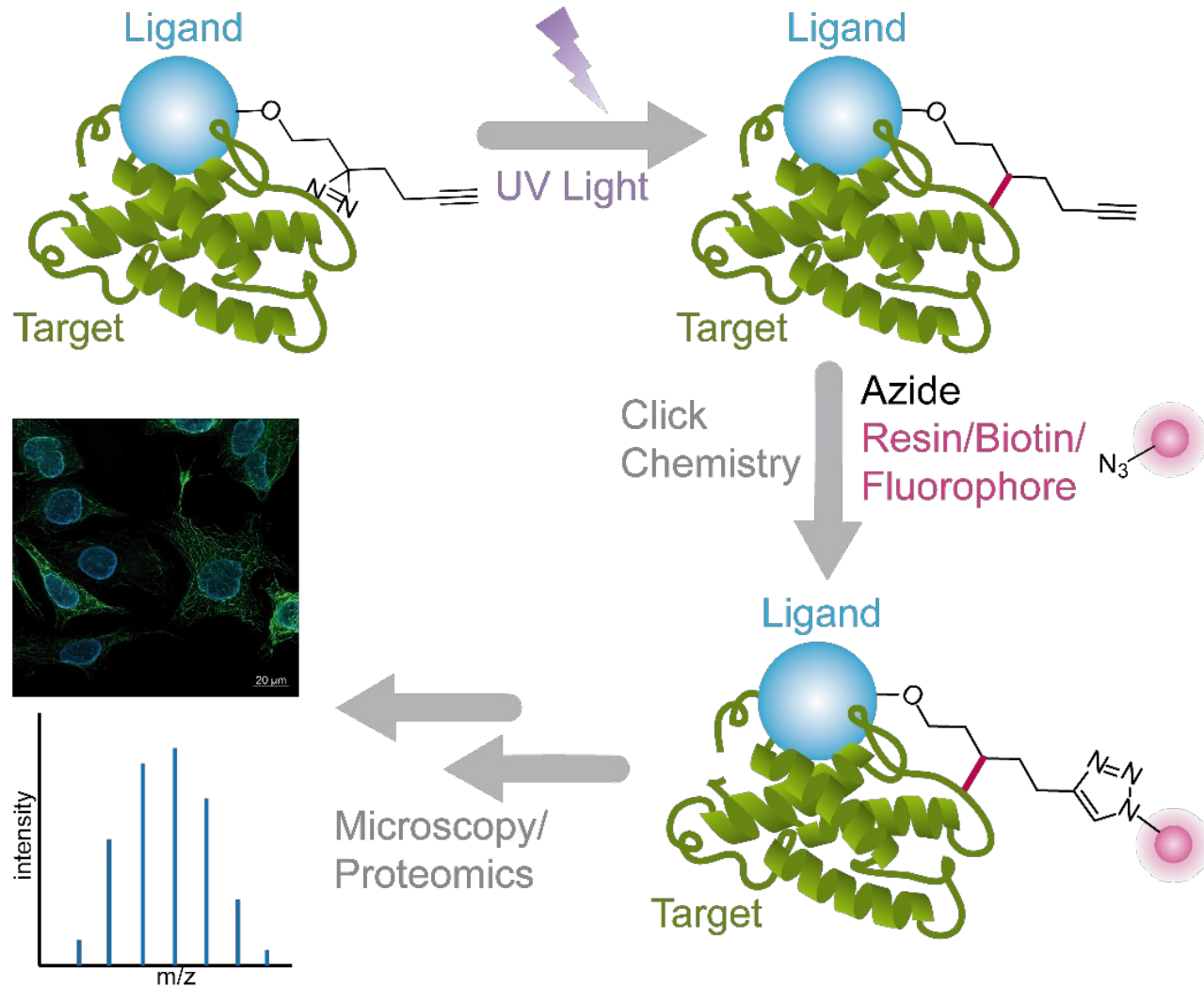


The Proteomics Shared Resource (PSR) provides expertise and instrumentation to assist the OHSU research community with mass spectrometric analysis of proteins.



Ashok Reddy
Director

Protein Target ID via Photo-Affinity Labelling



A photo-affinity label is a ligand modified with a diazirine and an alkyne.

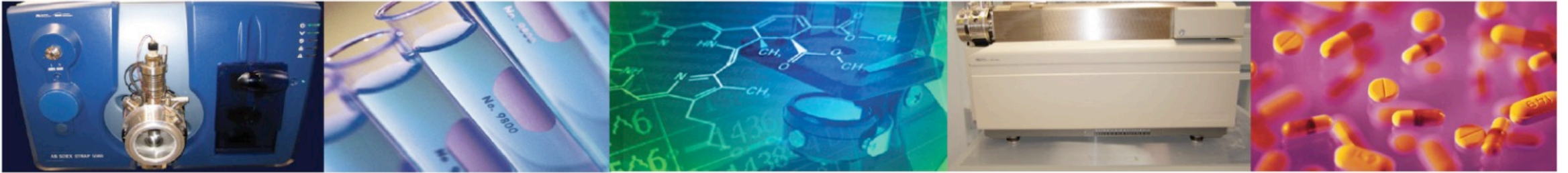
Cross-link to target protein with UV light.

‘Tag’ with a fluorophore or biotin.

‘Tagged’ protein(s) can be visualized or isolated.

Enables target and/or active-site identification via proteomic analysis.

Bioanalytical/Pharmacokinetics



The Bioanalytical Shared Resource/Pharmacokinetics Core provides the OHSU research community with access HPLC, GC/MS and LC-MS/MS instrumentation and expertise for the analysis of small molecules from biological sources.

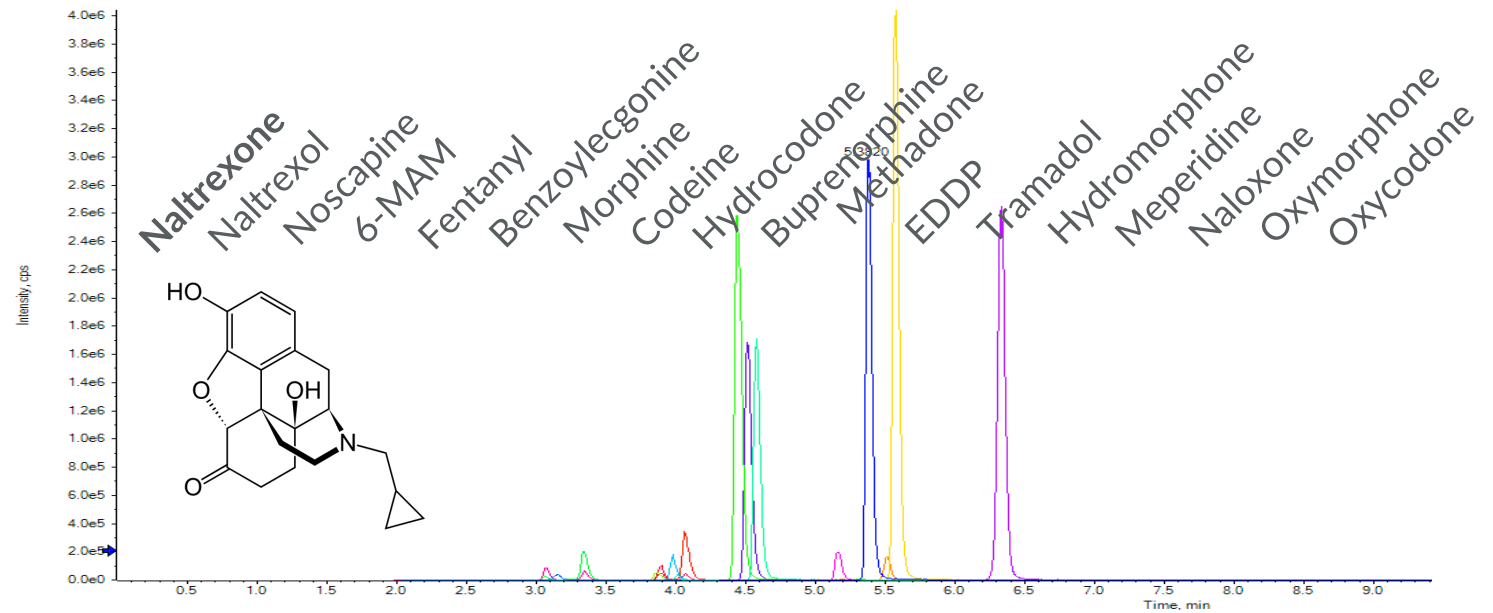


Andrea DeBarber
Director

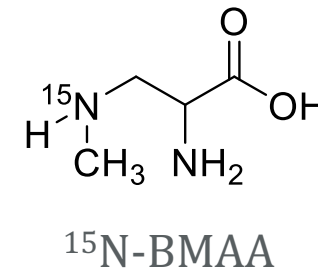
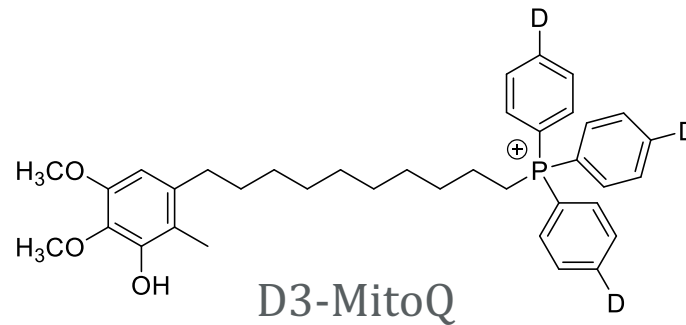
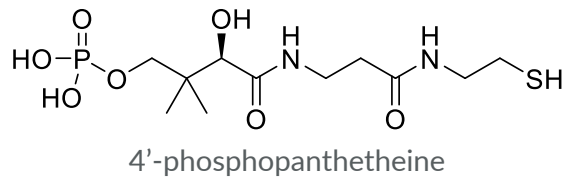
Synthesis of Small Molecules to Aid Bioanalytical Experiments

Bioanalysis of small molecule drug analytes in plasma.

Cristina Lancioni, MD
Division of Infectious Diseases



Susan Hayflick and
Penelope Hogarth



Synthetic materials can be used in biophysics experiments.

Med Chem Core



Microwave Peptide Synthesizer

Biophysics Core

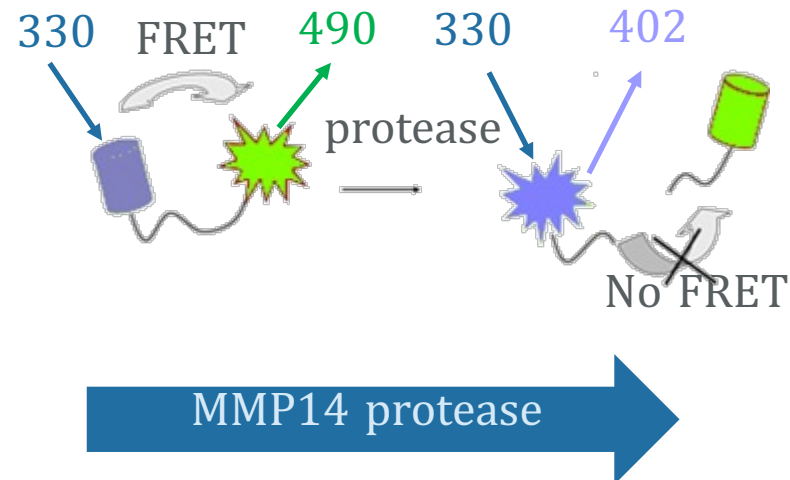
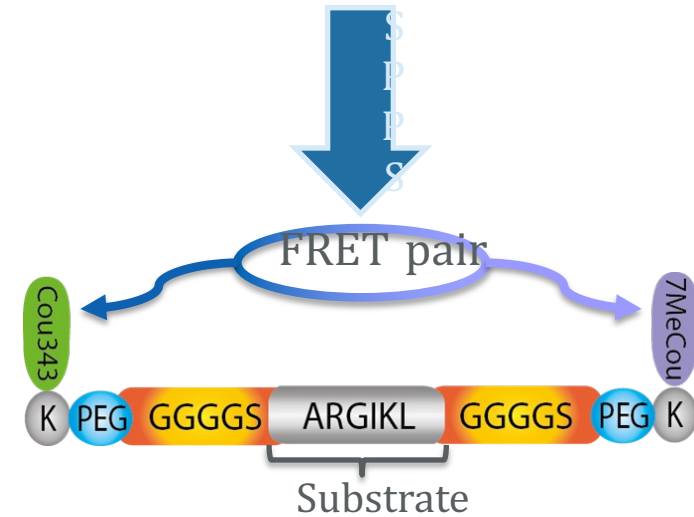


Fluorescence Spectrometer

Analysis of protein-protein and protein-small molecule interactions.



Ujwal Shinde
Director



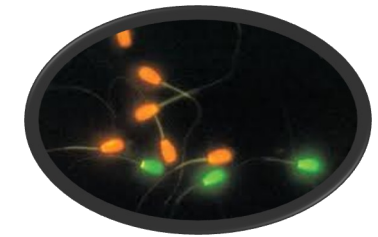
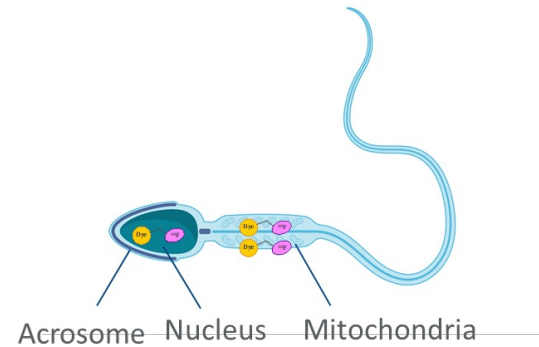
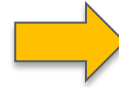
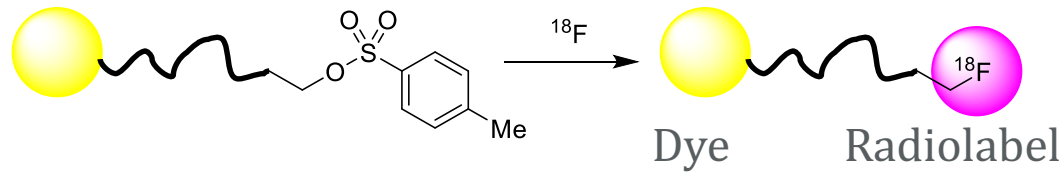
Center for Radiochemistry Research



Sanjay Malhotra
Director

Provides scientists with access to a suite of powerful tools for imaging with short-lived radionuclides.

Synthesis of Radiotracer Precursors



Primate Multimodality Imaging Center

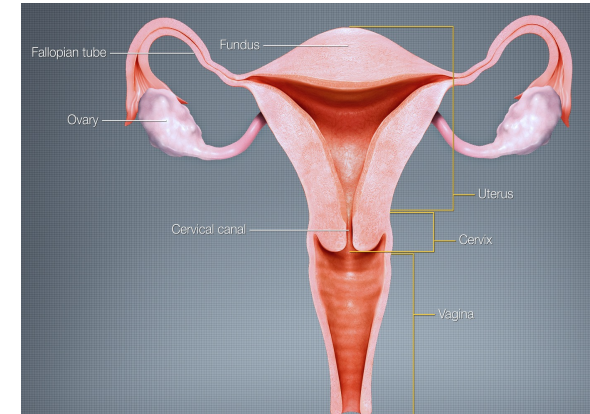
Leo Han and Carol Hanna, ONPRC



Biplane angiography



Prisma 3T MRI



By <https://www.scientificanimations.com>



iDEXA



PET-CT



Spec-CT



New materials lead to new intellectual property.



OHSU Office of Technology Transfer

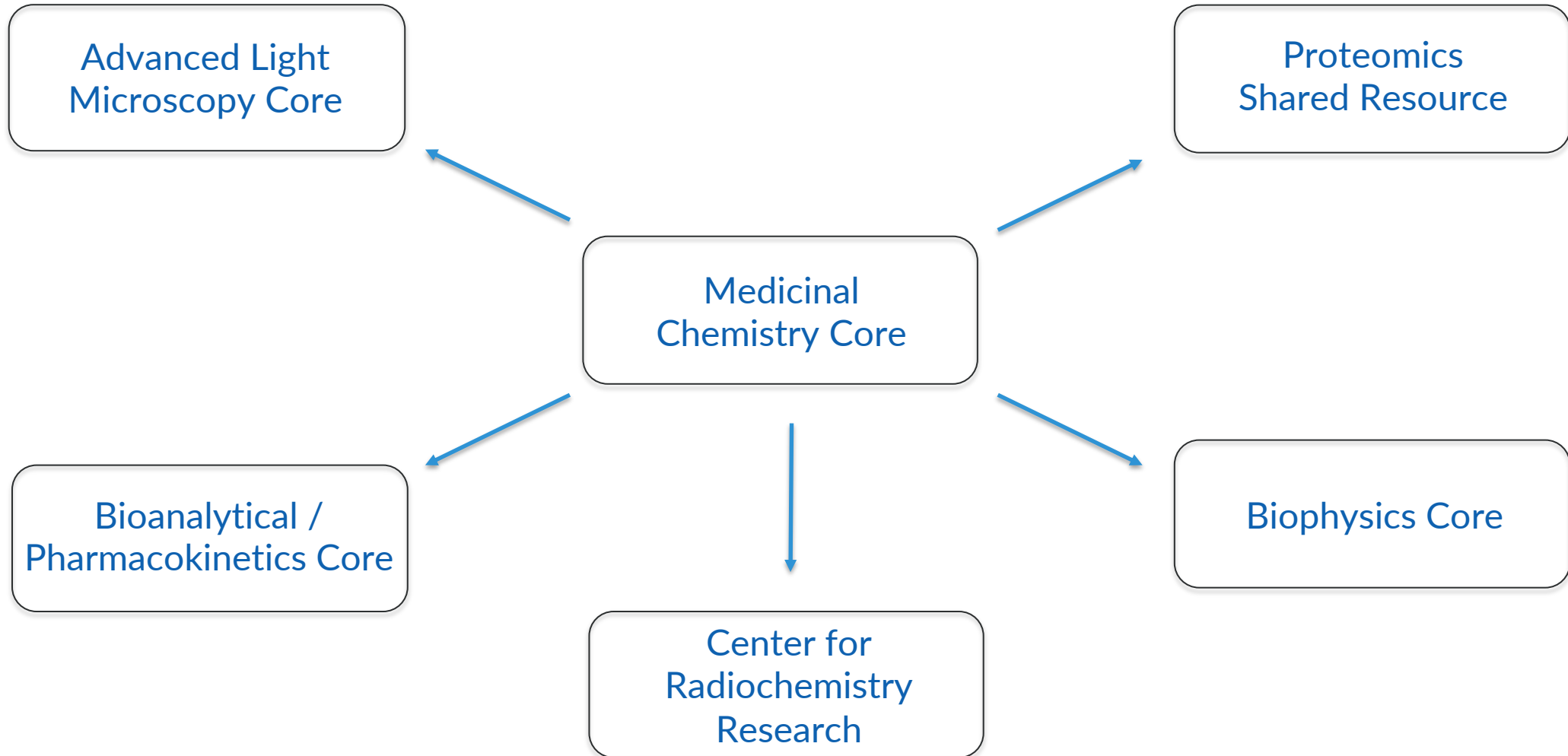
Travis Cook, MS, MBA, CLP
Senior Director

Med Chem Core IP

- Seven patents.
- Three active license agreements.
- Countless technology disclosures.



Synthetic chemists are our friends.



Thank you, USR staff!

Andy Chitty

Steve Cofield

Tabatha Pulliam

Craig Mazur

Hope Andersen

Aaron Larson (alumnus)

