

The New X-ray Footprinting Beamline at NSLS-II

ALS User Workshop

Mark Chance, PhD

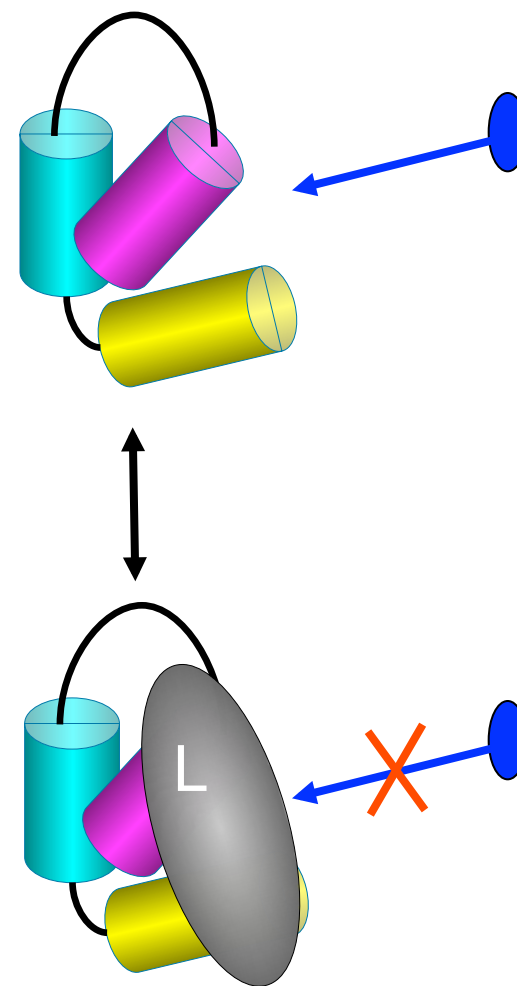
Director, Center for Proteomics and Bioinformatics and
Center for Synchrotron Biosciences
Case Western Reserve University

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Declared Conflict: CWRU technologies for footprinting are licensed to Neo
Proteomics Inc. where MC is a shareholder and officer

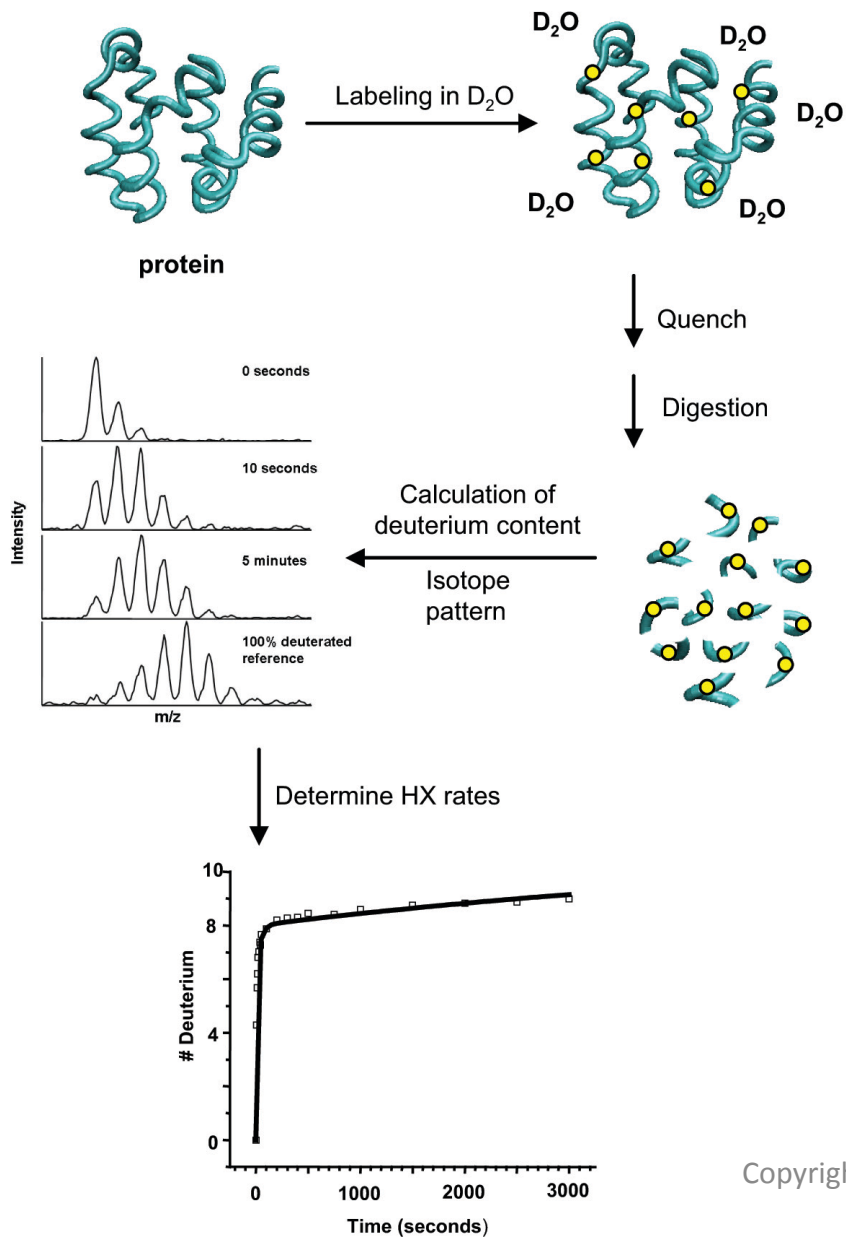
Footprinting of Macromolecules

- Covalent Chemical Change of a Macromolecule to assess conformation
- Long History of Development: Many Reagents
- Formalized by Galas & Schmitz, 1978
- Labeling chemistry understood
- Ability to label across the macromolecule
- Ability to recover labeling information comprehensively

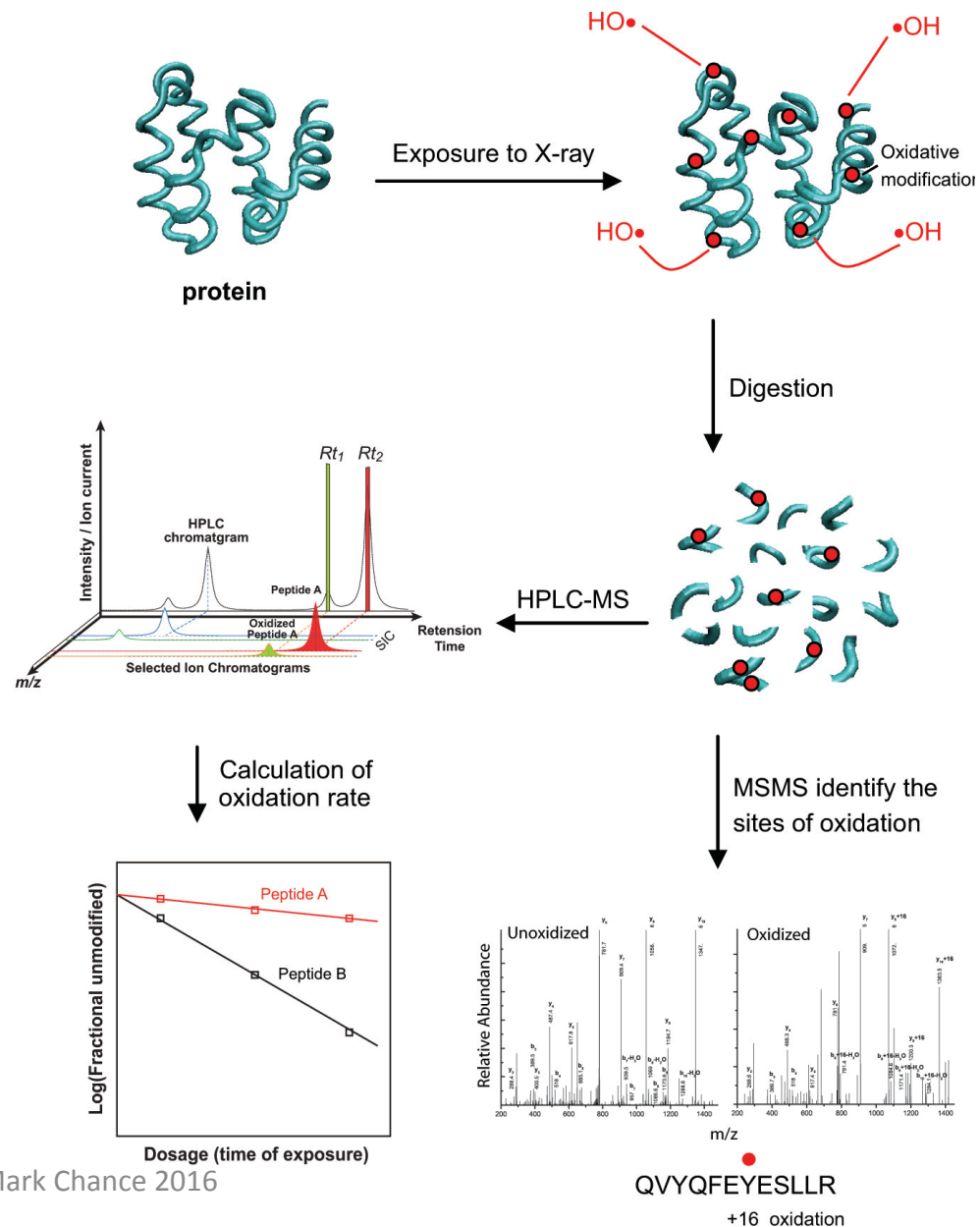


Molecular Footprinting of Proteins

HDX-MS

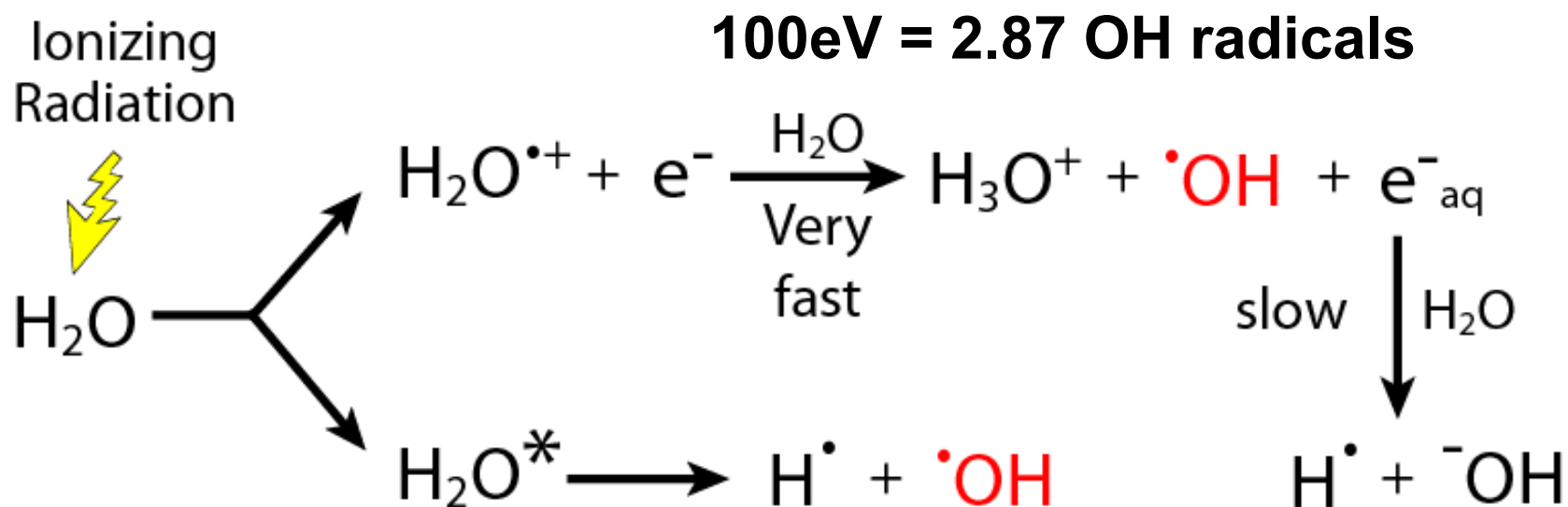


HRF-MS



Generation of OH radicals: Synchrotron as light bulb

Radiolysis of water



National Synchrotron Light Source-II



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Center for Synchrotron Biosciences

Center for Synchrotron Biosciences

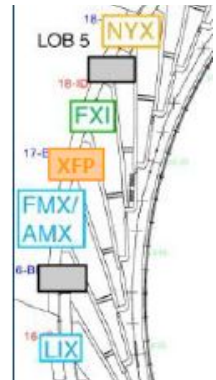
P30 Objectives

- Design, build and operate world-class facilities for biophysics research at the new National Synchrotron Light Source-II (NSLS-II).
- (Re)-establish user programs in footprinting (**FP**), crystallography (**MX**), x-ray spectroscopy (**XAS**), small-angle x-ray scattering (**SAXS**).
- Encourage a Biology Village vision for collaborative science at NSLS-II.

CSB at
NSLS-II

Footprinting/HDX
•Local conformation change
•Binding interfaces

A
Structural
Biology
Village



High-Resolution
Structure
(MX and XAS)
•High resolution
•Local and global

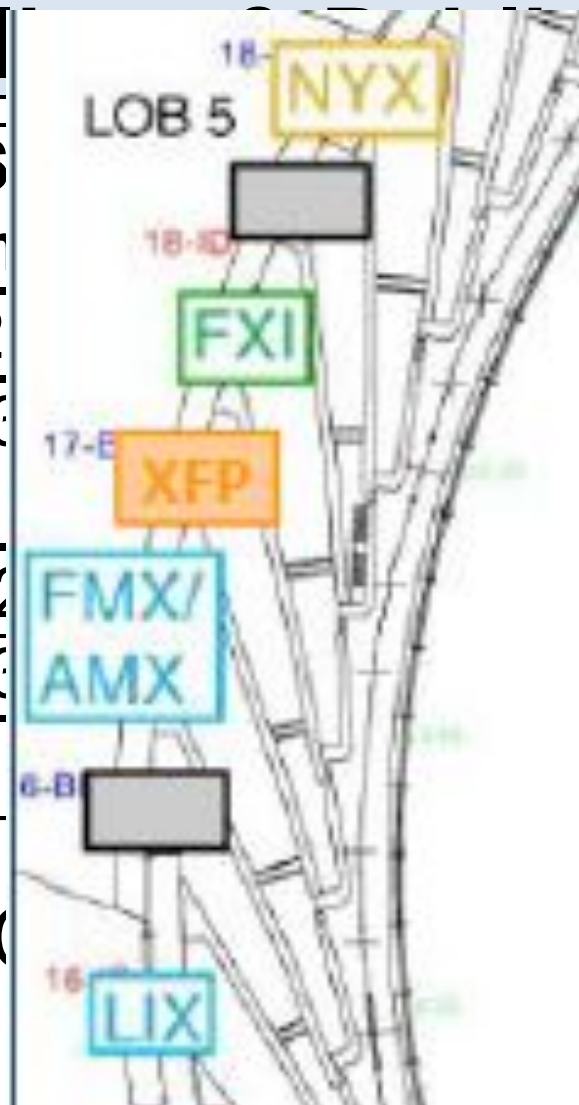
Multi-technique
Approach to
Structure
Determination

Small Angle
X-ray Scattering/EM
•Global Conformation
•Large Complexes

CSB Beamlines

ations

Technique	NSL
Footprinting	X2
X-ray spectroscopy	X3
Crystallography	X2
	X3
Totals	



NSLS-II Beamlines
XFP
ISS
XAS@XFP
FMX
AMX

NSLS (

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XFP Layout

