

# Cell Death Signaling lab

## Pyroptosis, Epigenetics and Proteomics

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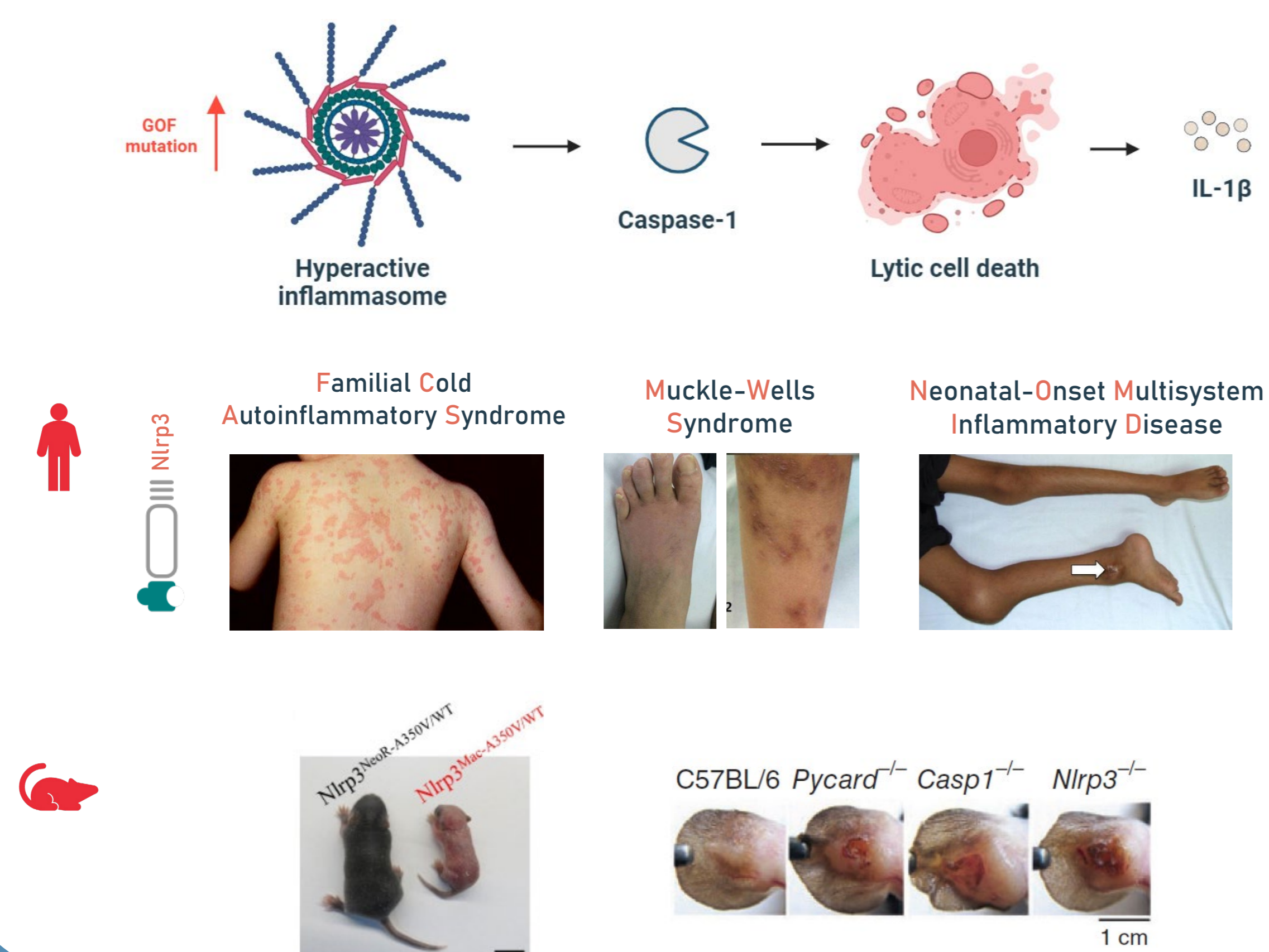


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Pyroptosis team

**Inflammasomes** are large protein complexes activated by microbial- as well as danger-associated molecular patterns. Activated inflammasomes elicit **pyroptotic cell death**, which releases the pro-inflammatory cytokine IL-1 $\beta$ .

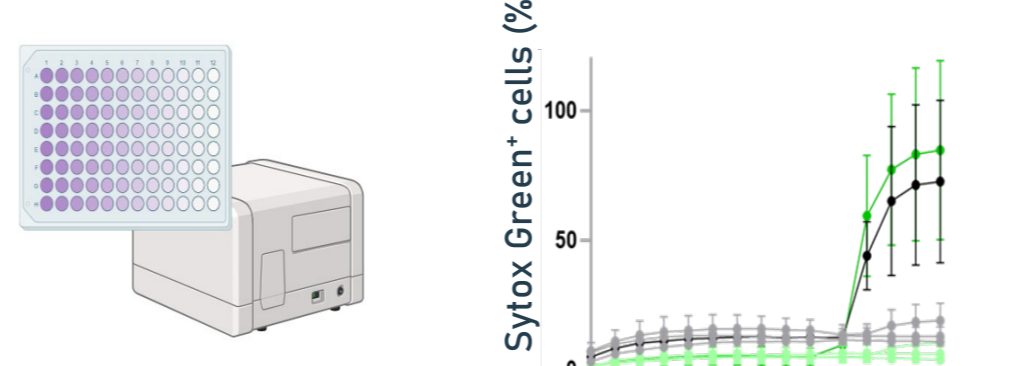
### 1. Inflammasome signaling is important in autoinflammatory disease and infection

### 2. Techniques to evaluate the role of cell death and cytokine release in infections and autoinflammatory diseases

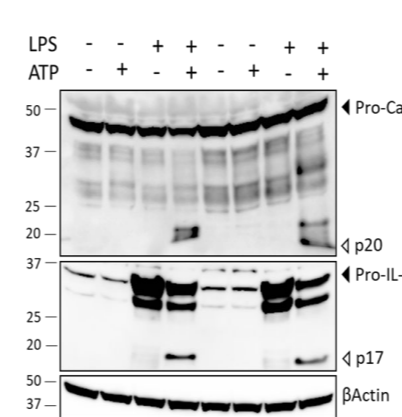


#### Cell death analysis

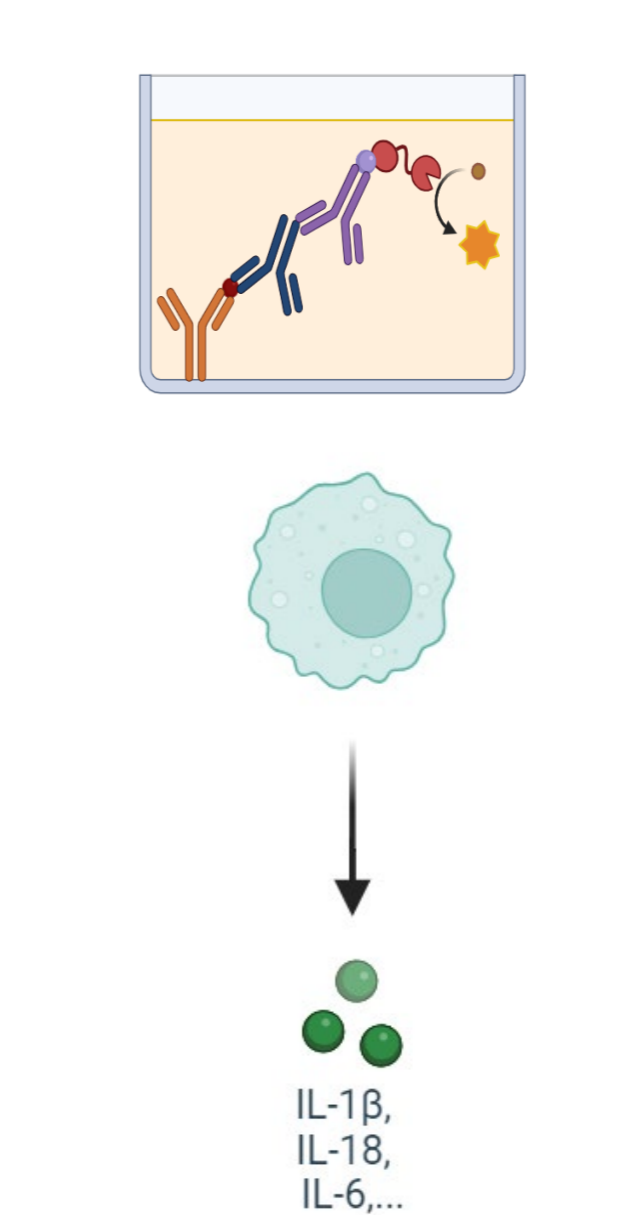
LDH assay      Real-time imaging



#### Western blot

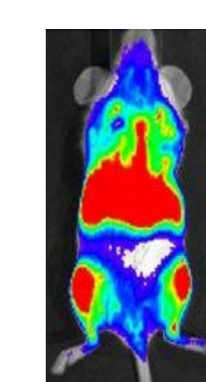


#### (multiplex) ELISA

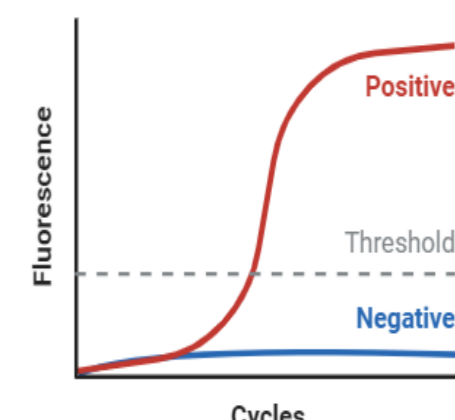


#### Evaluation of infection

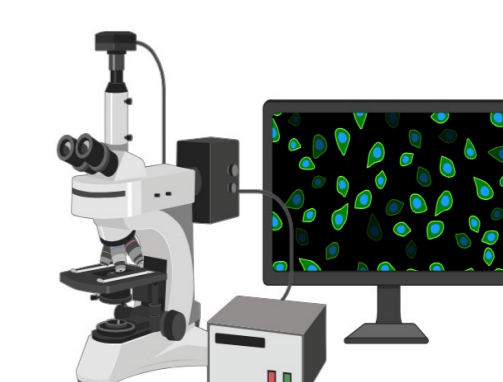
Bioluminescent imaging



Quantitative PCR



Histological analysis



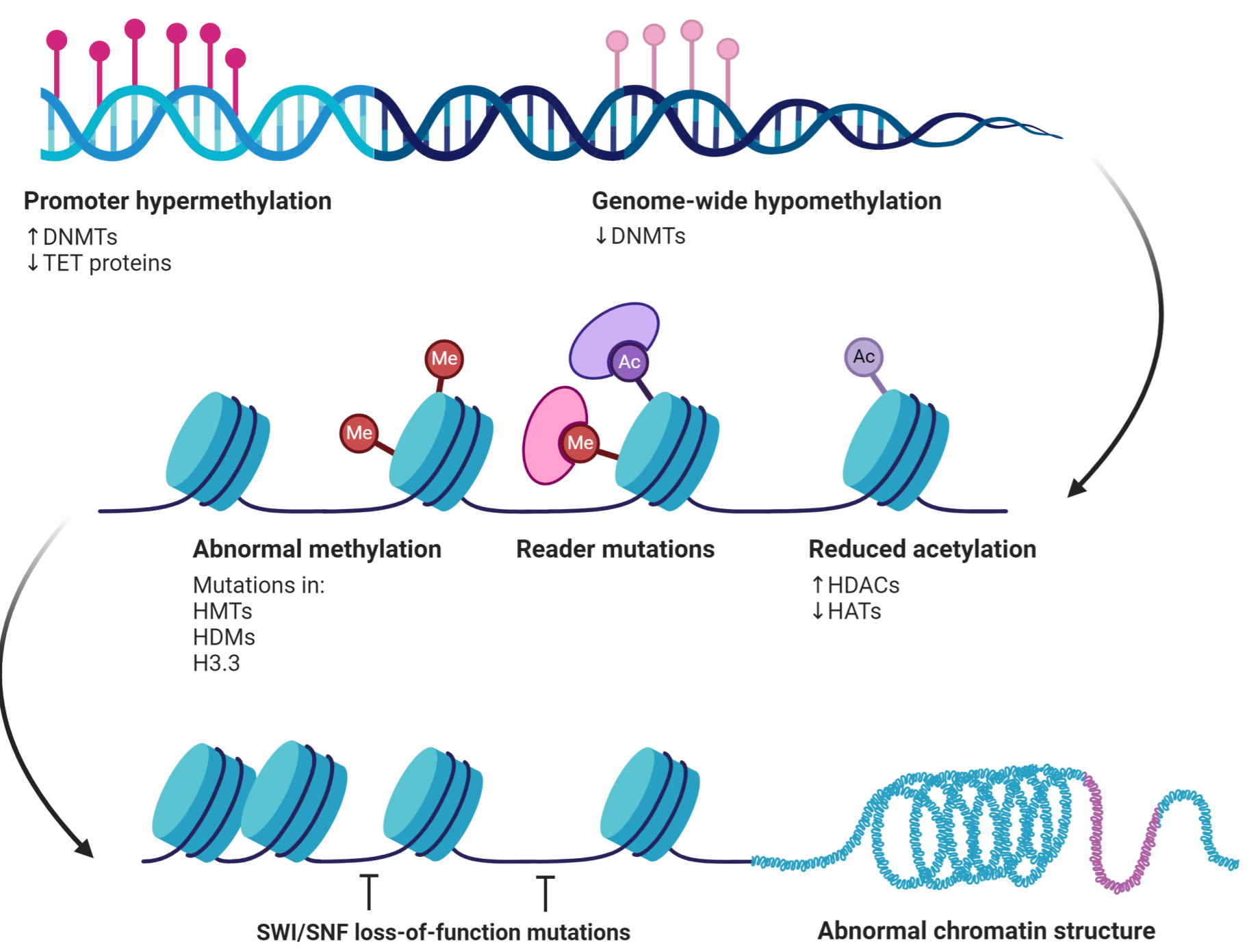
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Epigenetics team

**Epigenetics** consists of the causative role of heritable and environmental changes in gene expression, without altering the DNA sequence.

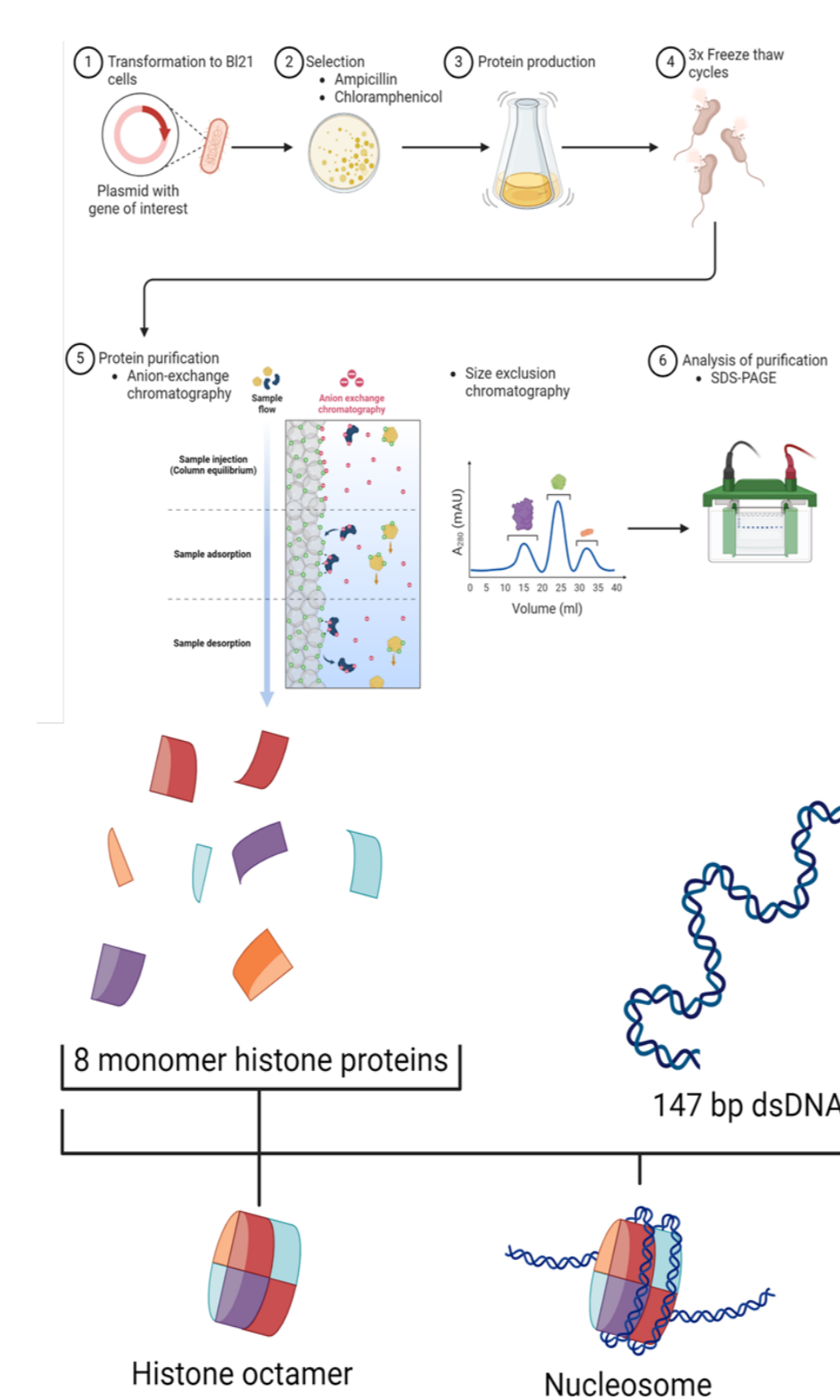
### 1. Epigenetics is an important driver of cancer therapy resistance

### 2. Techniques to evaluate the role of epigenetics in cancer therapy response and ferroptosis cell death signaling

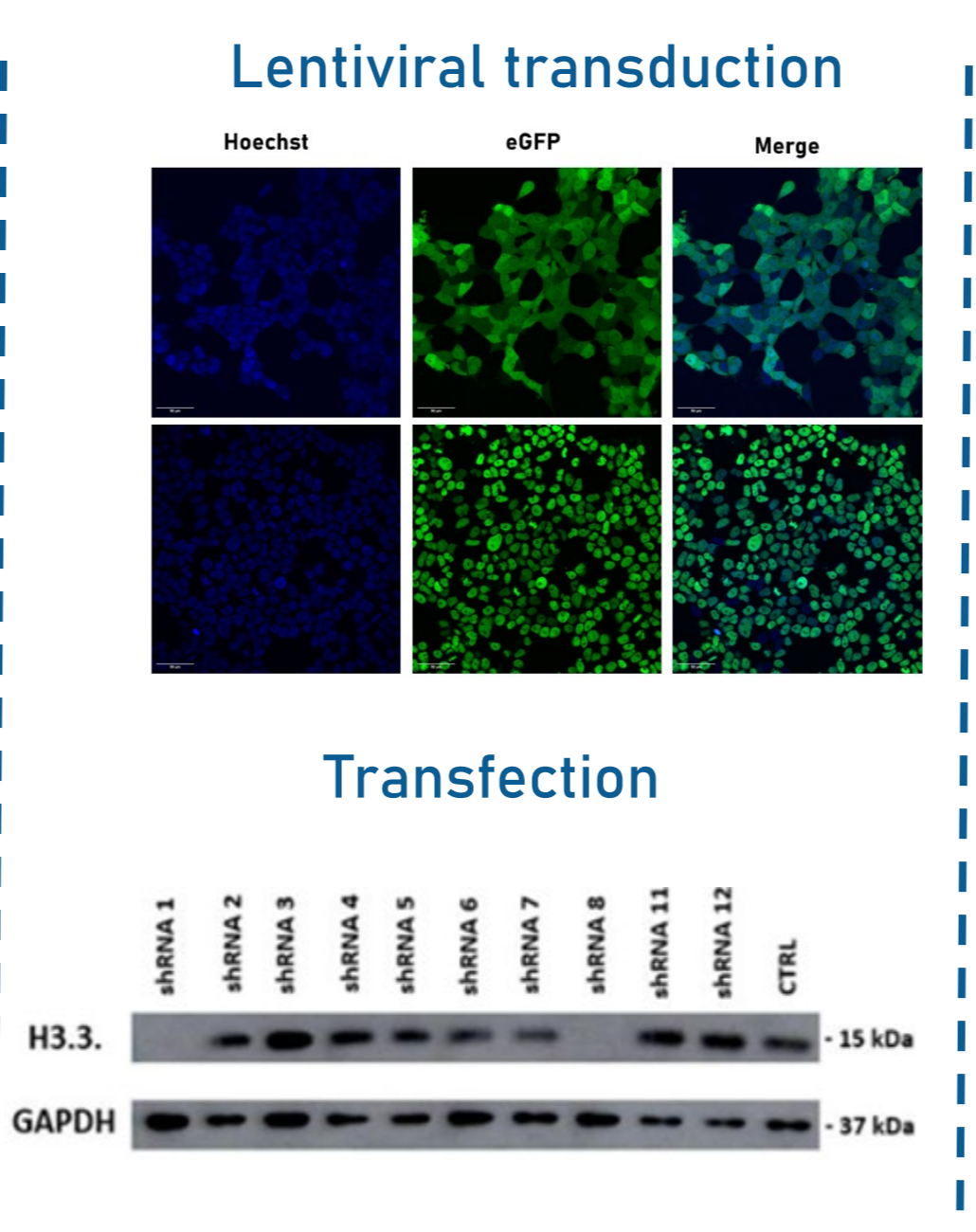
#### Histone PTMs, DNA-methylation and ncRNAs



#### Histone protein expression

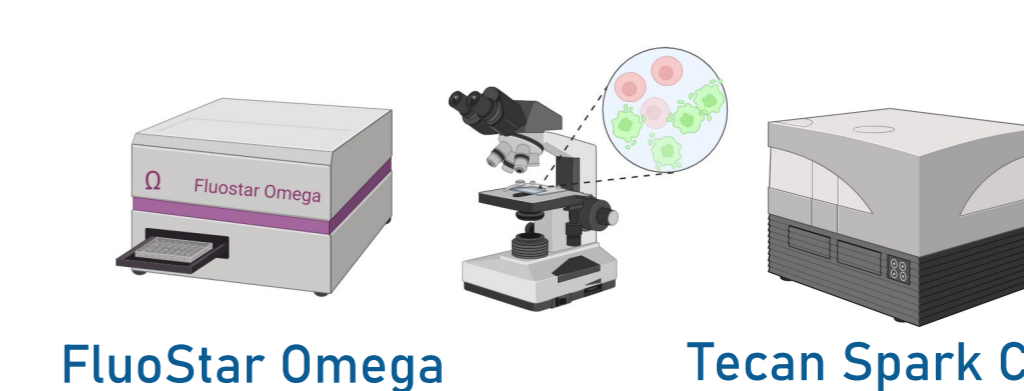


#### Transient & stable expression of histone variants-mutants

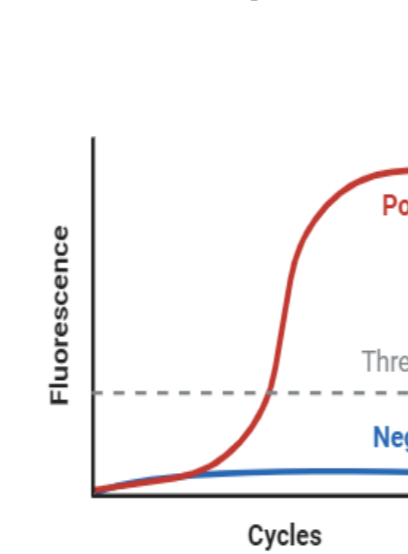


#### Cell death analysis

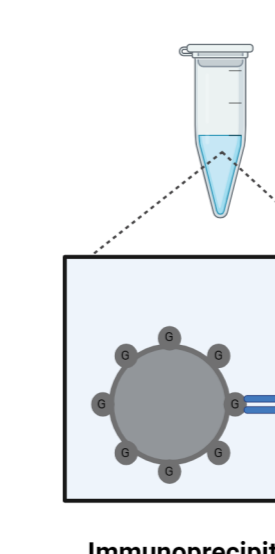
SytoxGreen/Blue assay



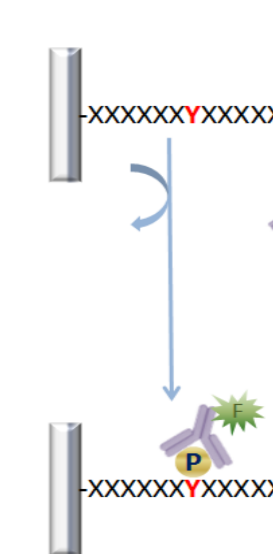
qPCR



(Co-)IP

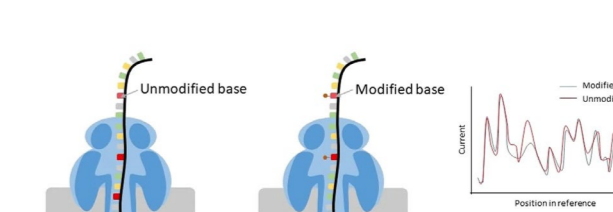


Kinase P

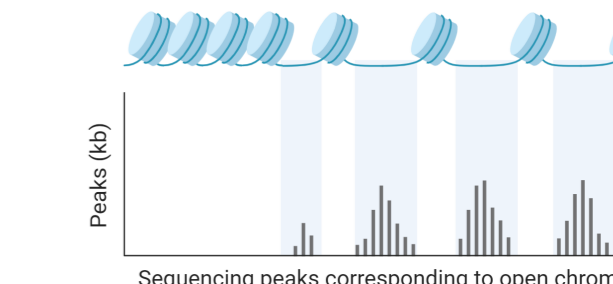


#### Epigenetic BioIT techniques

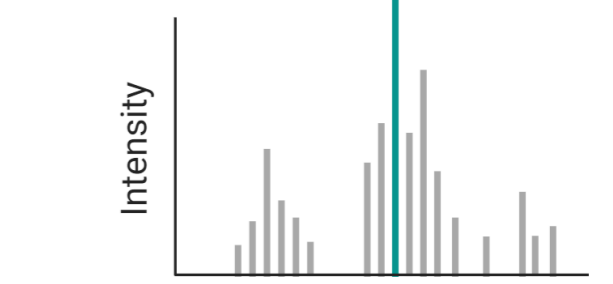
Nanopore - Episeq - RRMS



ChIP-Seq & ATAC-Seq



Top-down & bottom-up histone PTM MS



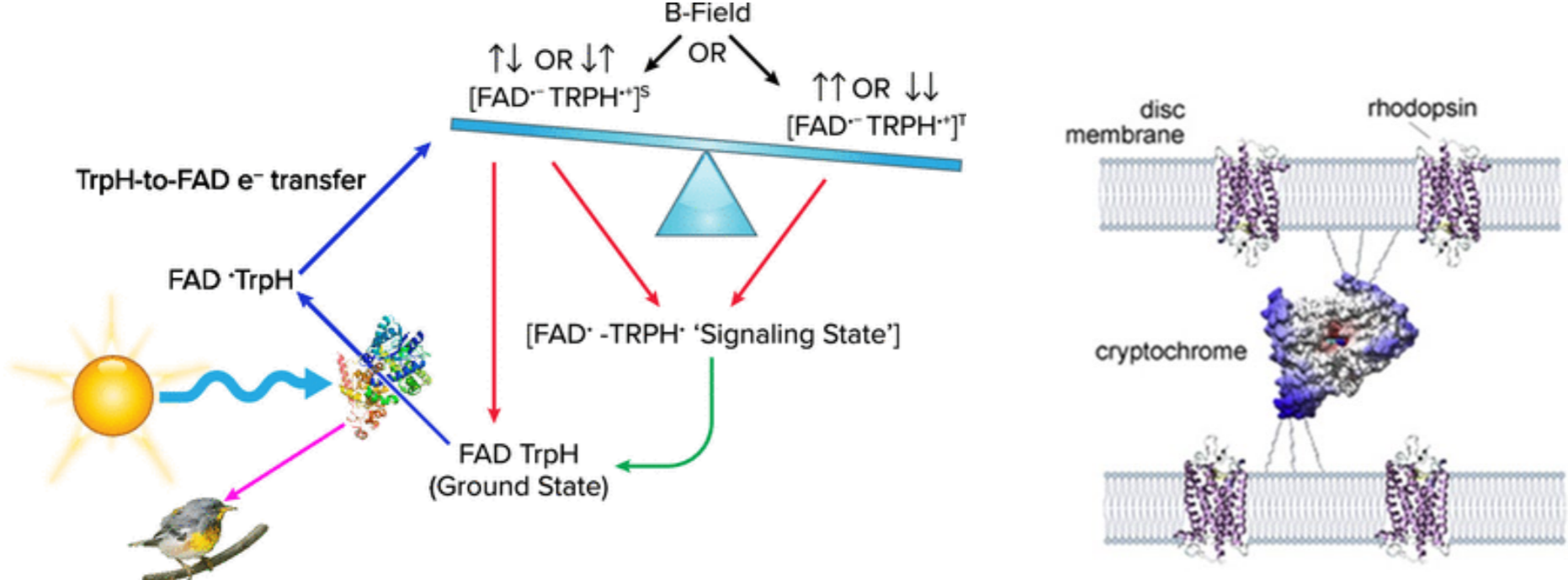
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Proteomics

**Quantum Biology** is the study of biological effects, based on the laws of quantum physics

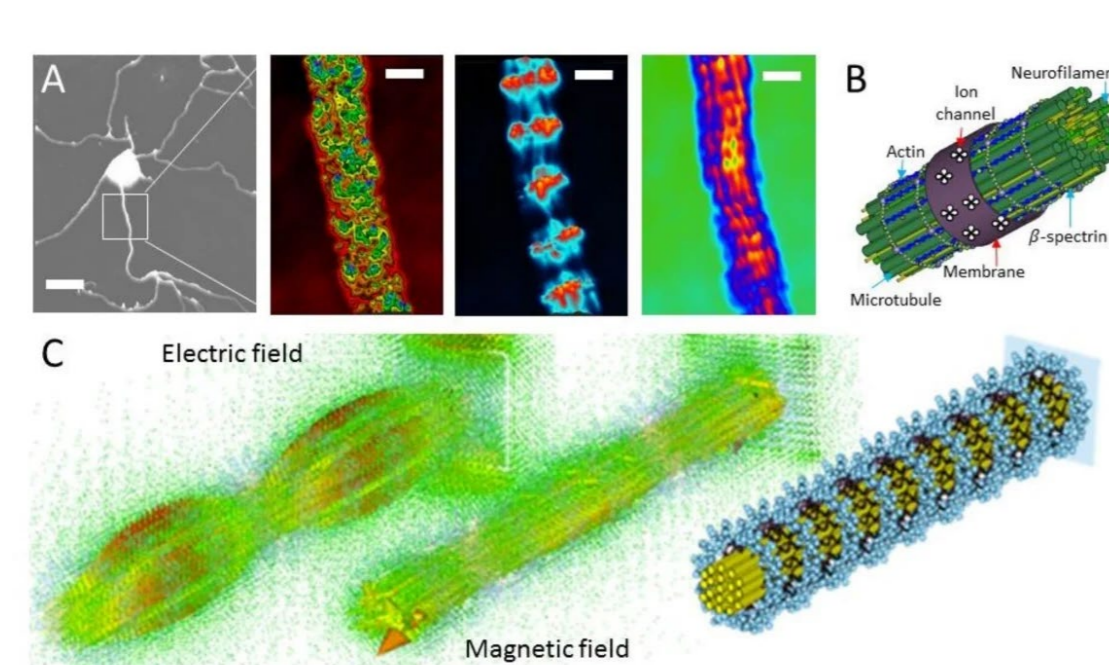
### 1. Quantum biology may explain many unresolved questions about intra- and inter cellular/tissue signaling

### 2. Proteomics techniques to examine biological effects for a quantum origin

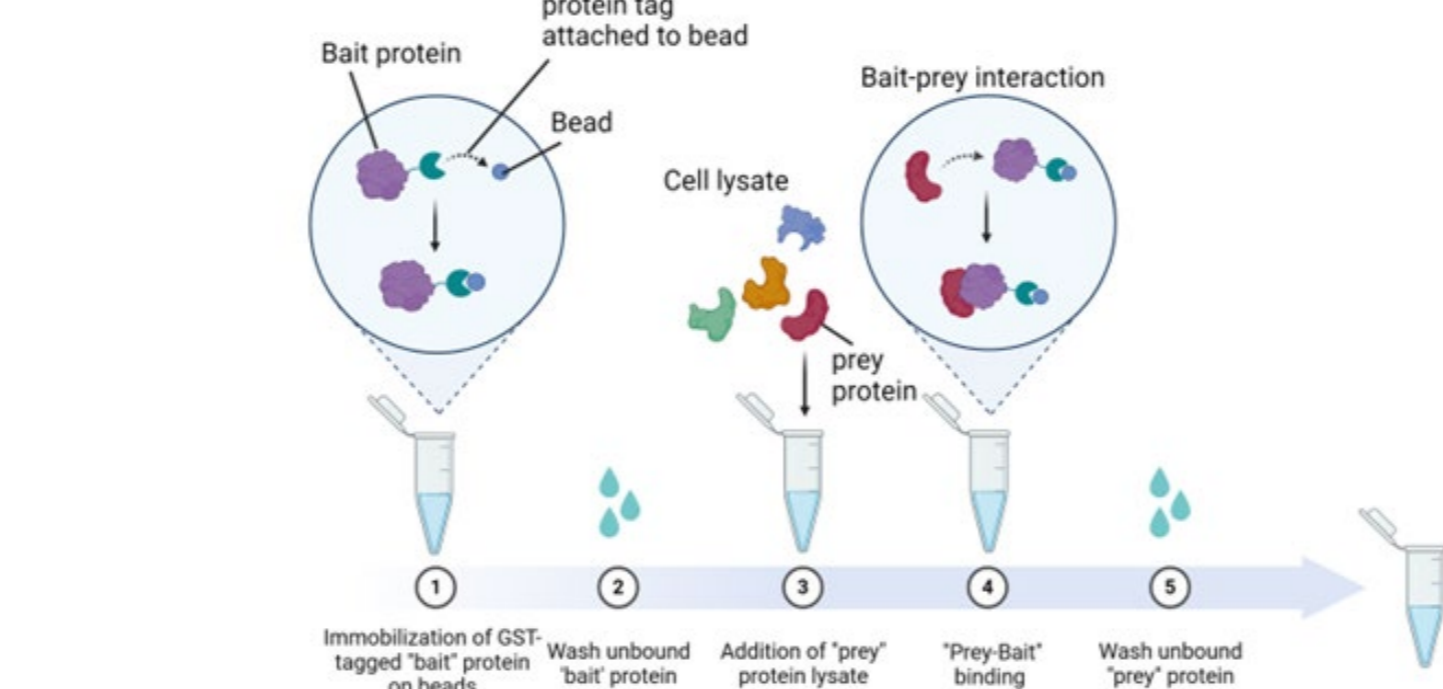
#### (Earth)magnetic field sensing



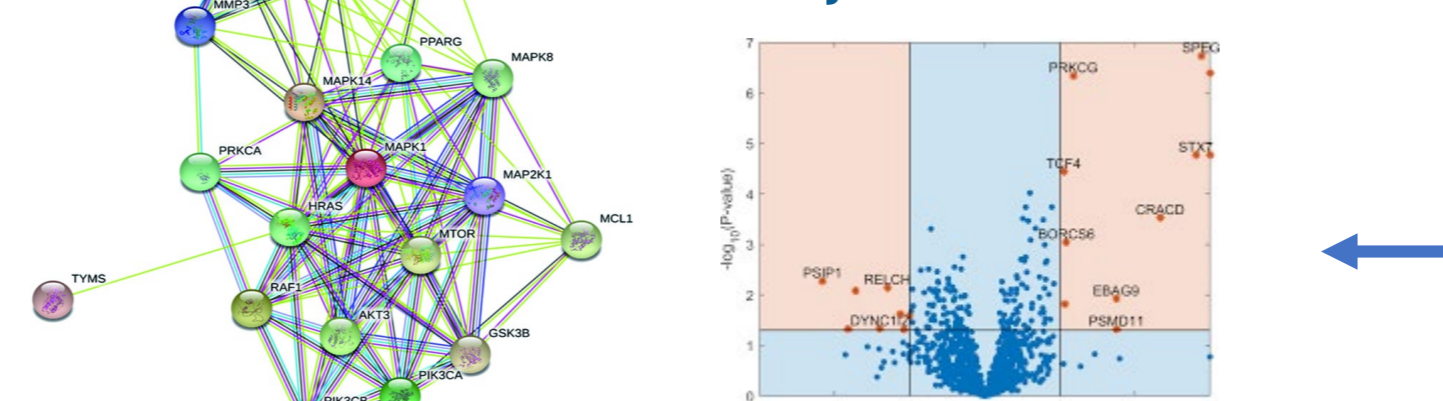
#### Ultrafast microtubule light energy transport



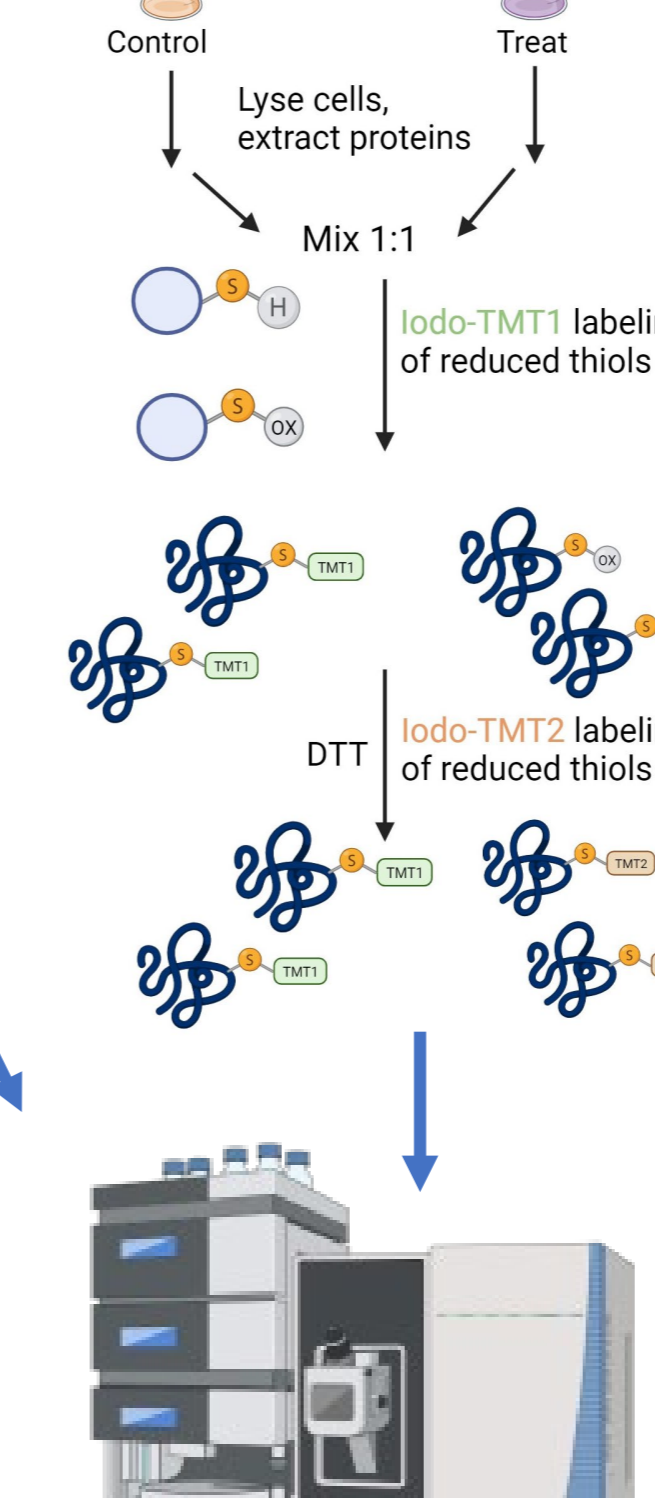
#### Protein-protein interactions



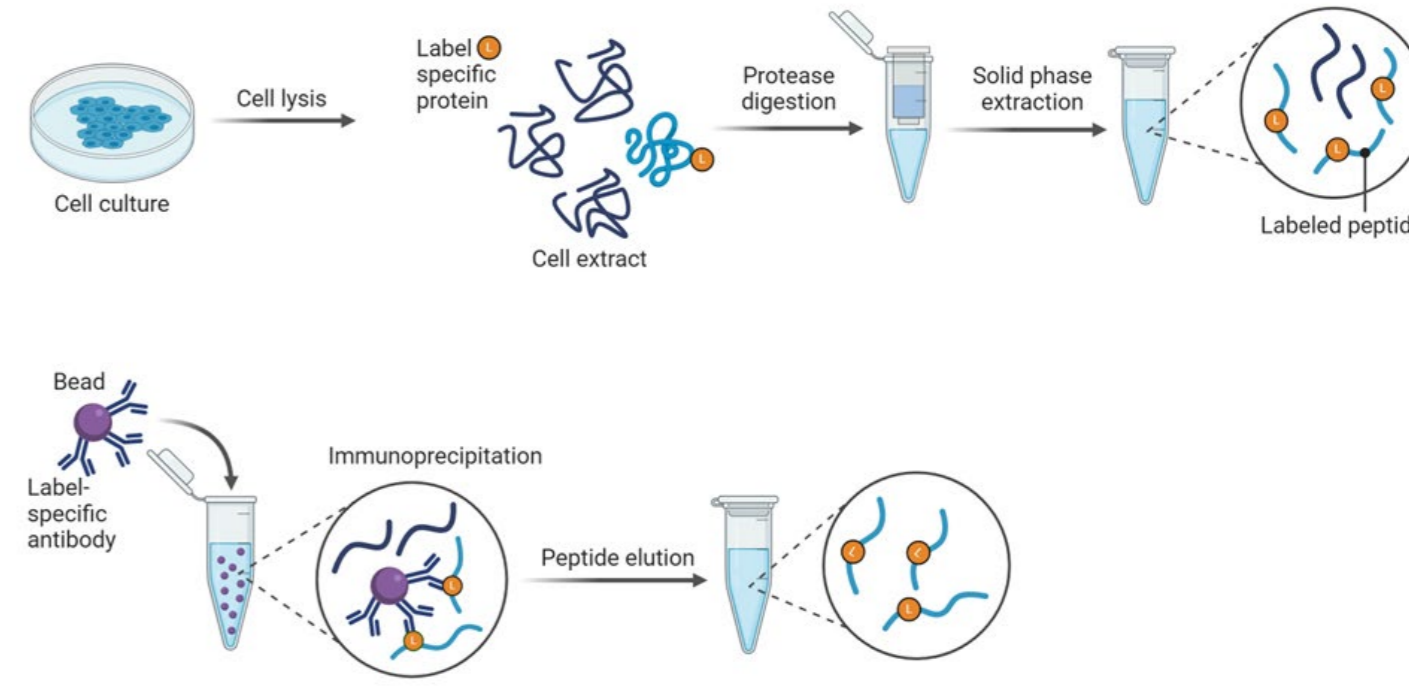
#### Data analysis



#### Redox proteomics



#### Posttranslational and chemical modification of proteins



Protein identification, quantification and characterization by LC-MS