

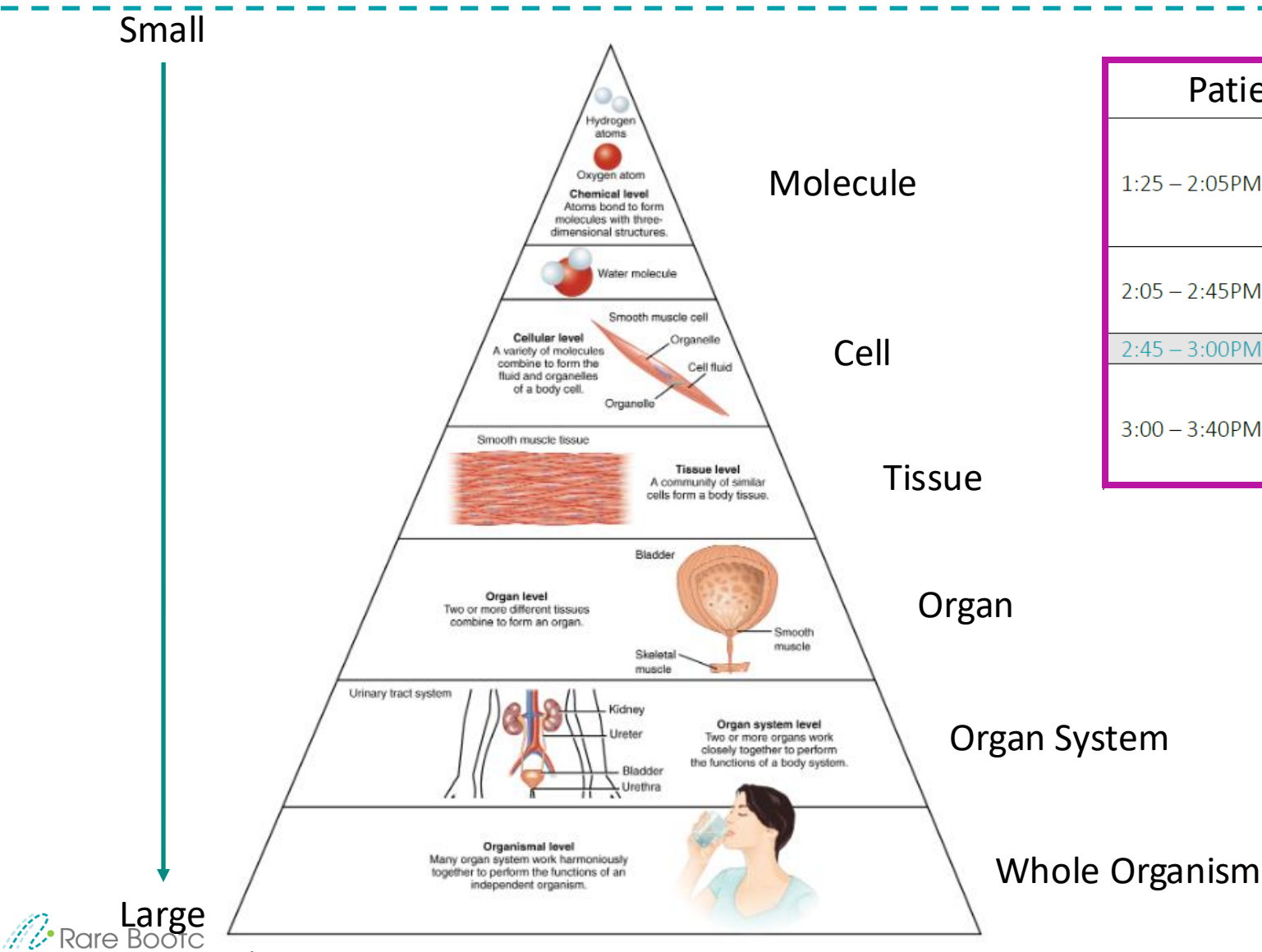


Therapeutic Modalities

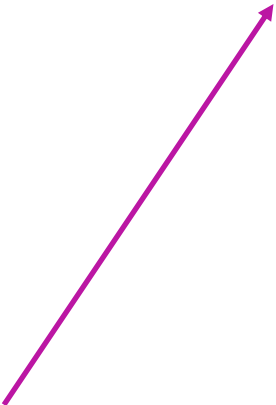
Arjun Natesan



Research Takes Place at Multiple Levels

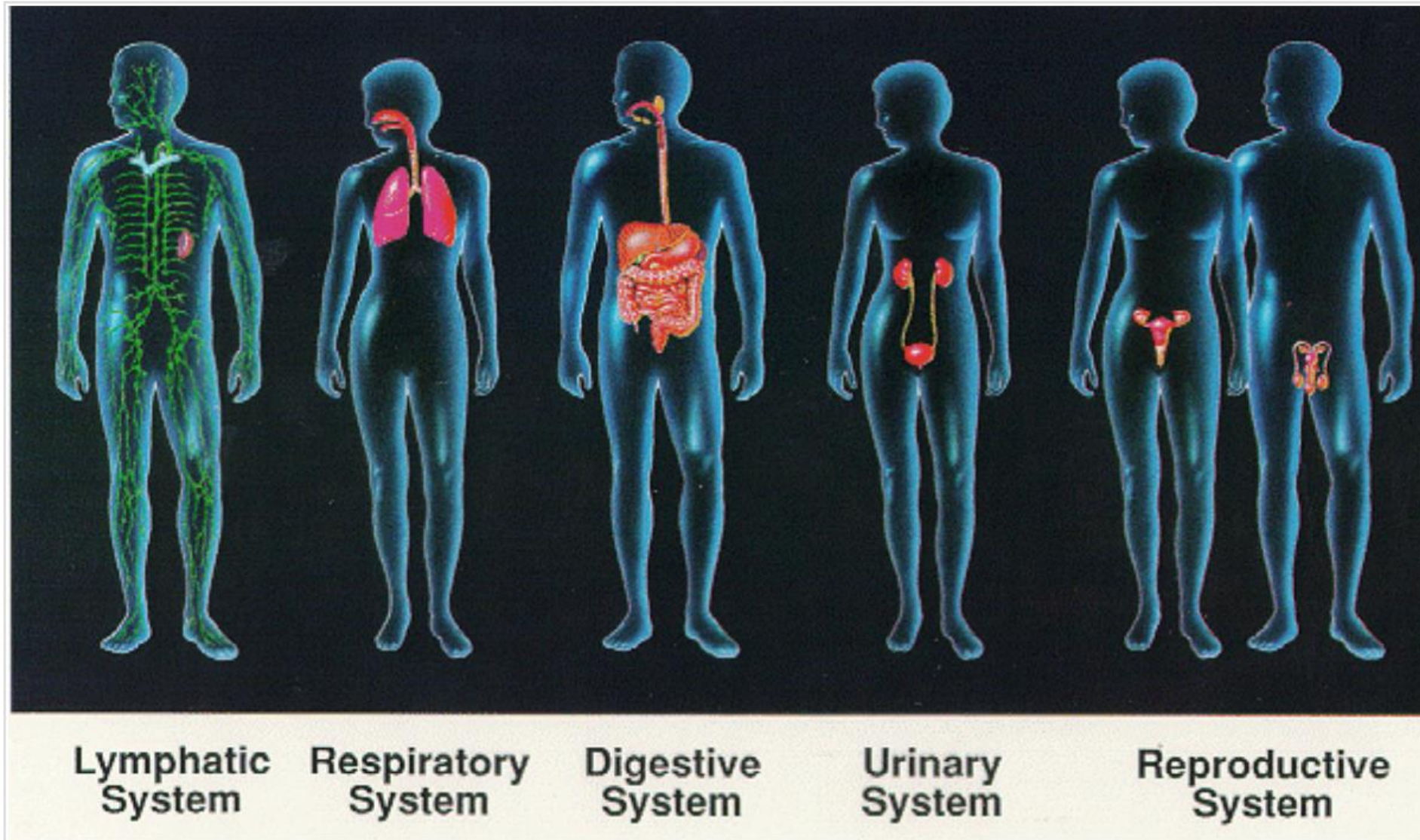


Patient Surveys & Natural History Studies:			
1:25 – 2:05PM	40 min	Binodh DeSilva, Ultragenyx	Biomarkers
2:05 – 2:45PM	40 min	Ali Skrinar, Ultragenyx	Clinical Endpoints
2:45 – 3:00PM	15 min	BREAK	
3:00 – 3:40PM	40 min	Eric Crombez, Ultragenyx	Clinical Trial Design

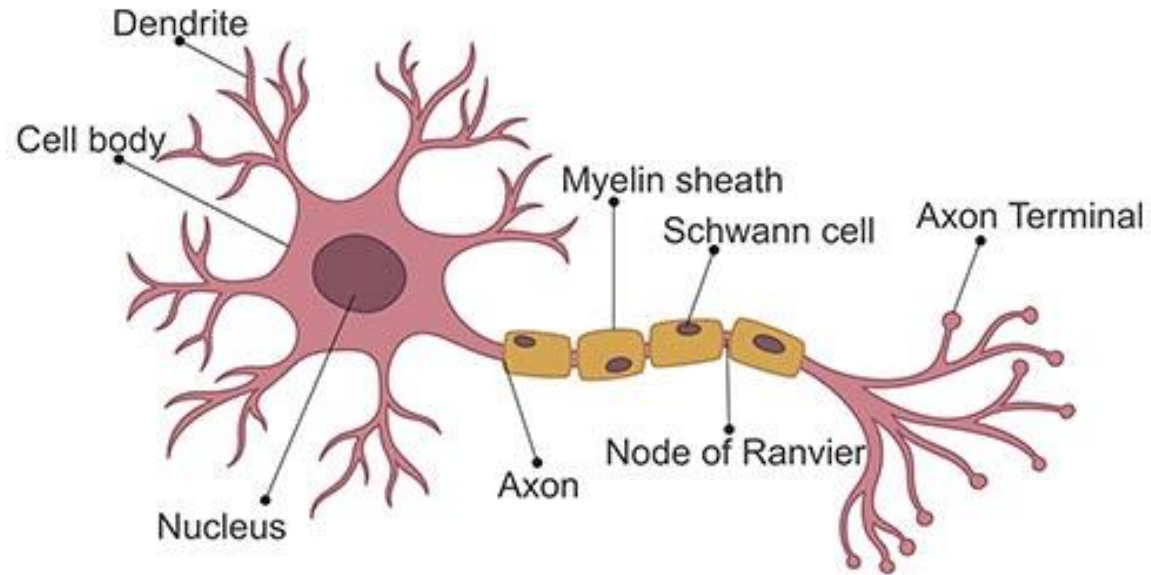


Organ & Tissue Level – what is not working leading to pathology?

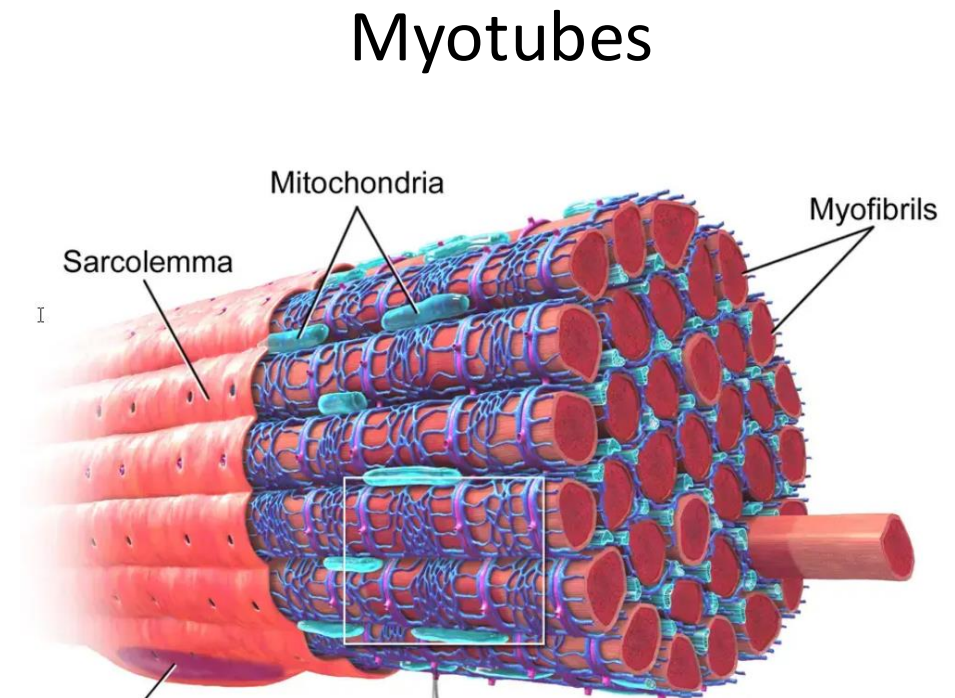
For a drug to work, you have to get it to the target



Cellular Level – Cell Types Have Specialized Functions



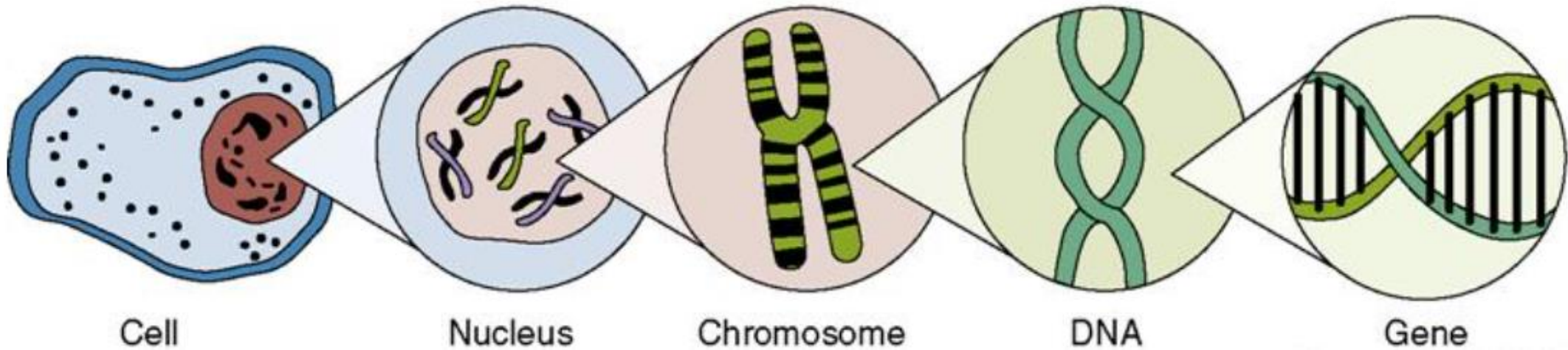
Neurons



Myotubes

Cellular to Molecular Level – Gene

A defective Gene can lead to cellular dysfunction



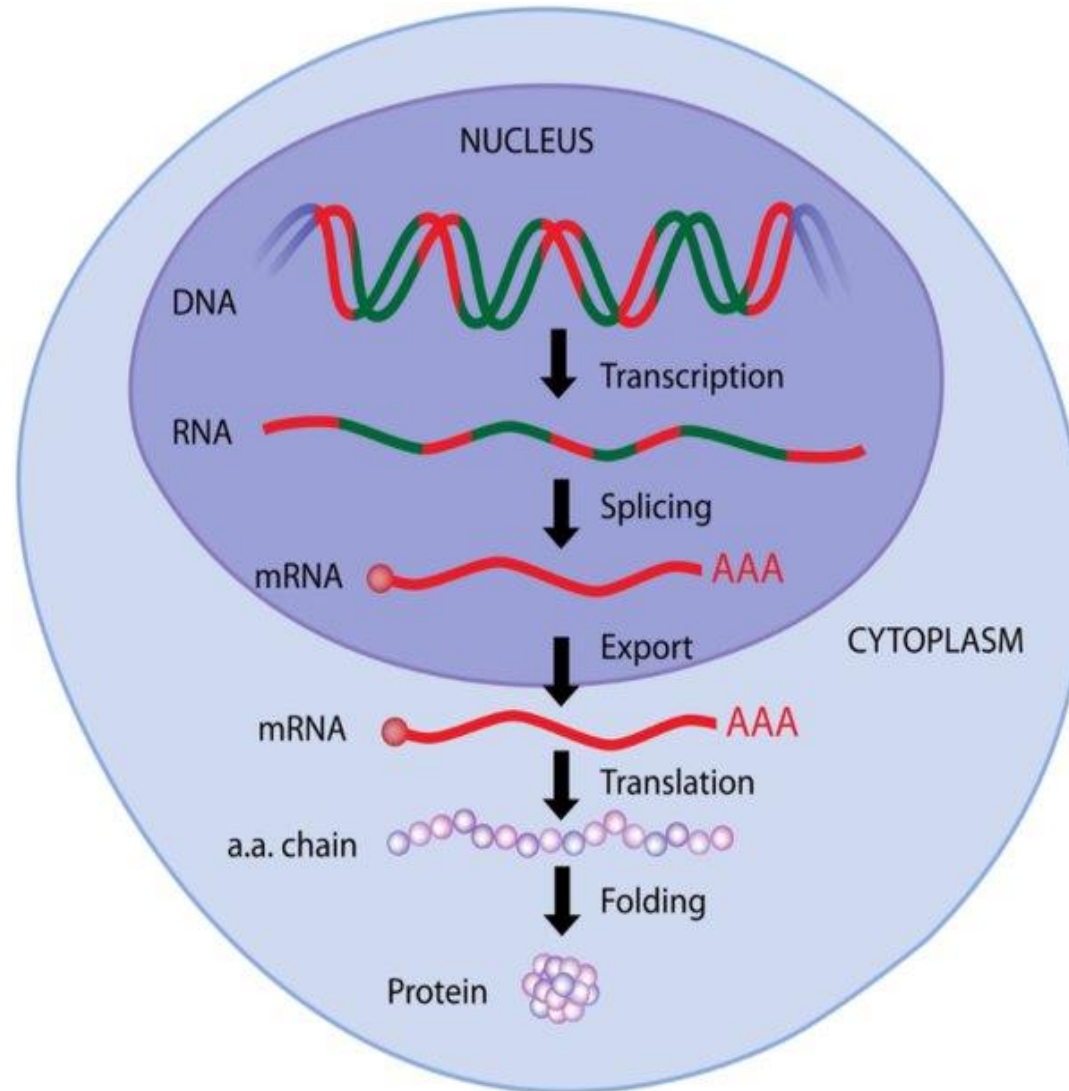
Gene – A basic genetic unit encoding instructions to make a specific protein or RNA molecule

- Human genome has roughly 20,000 protein-coding genes, but only ~ 1% of DNA codes for proteins
- Remaining ~99% non-coding DNA is important to regulating gene activity – contains promoters, enhancers, and silencers

Molecular Level – Central Dogma

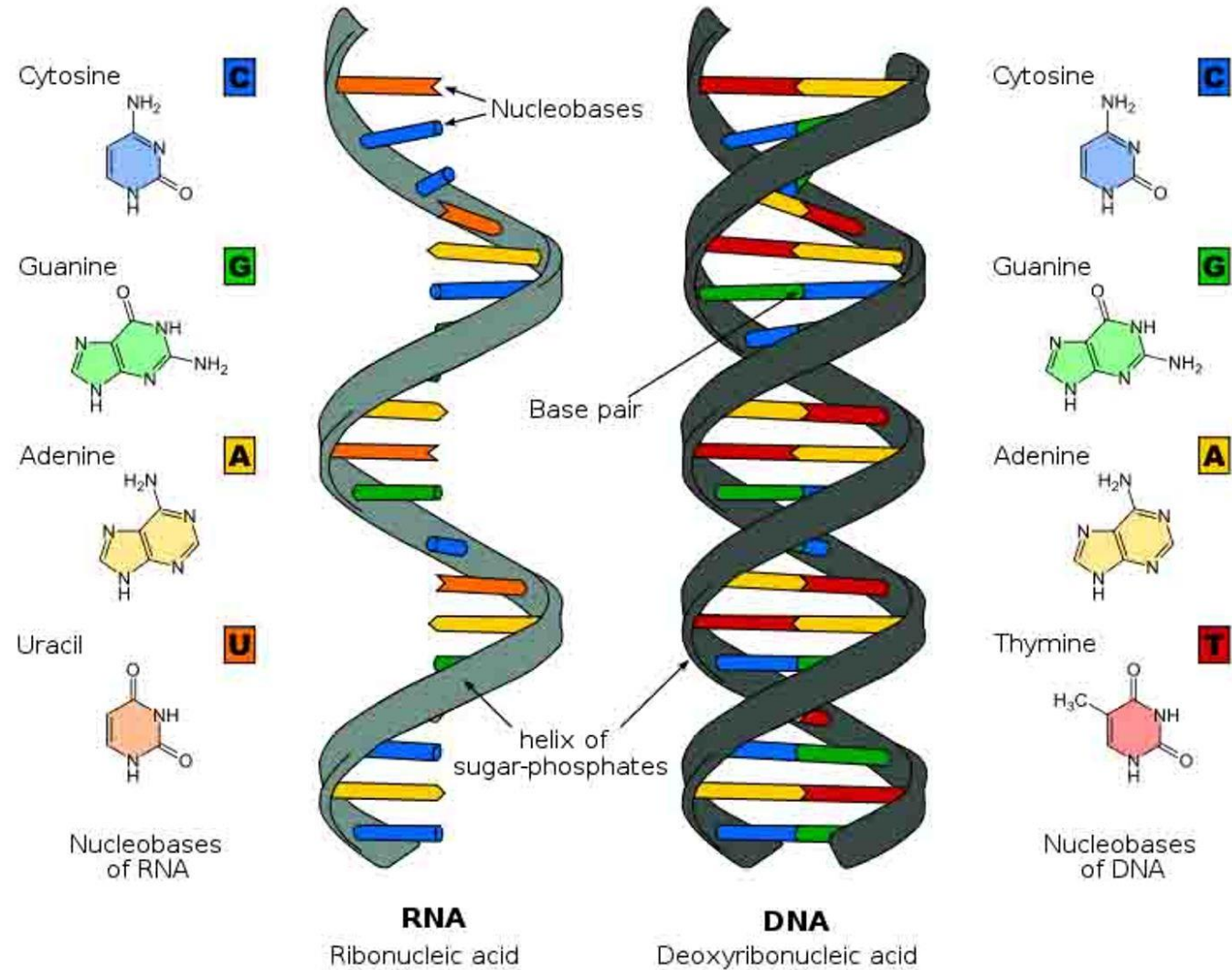
Therapeutics are being made to Modulate Every Step of this Process

Exons —
Introns —



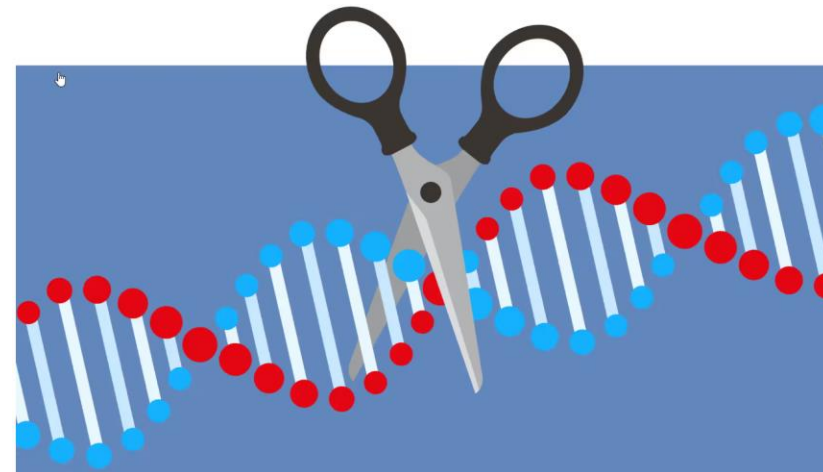
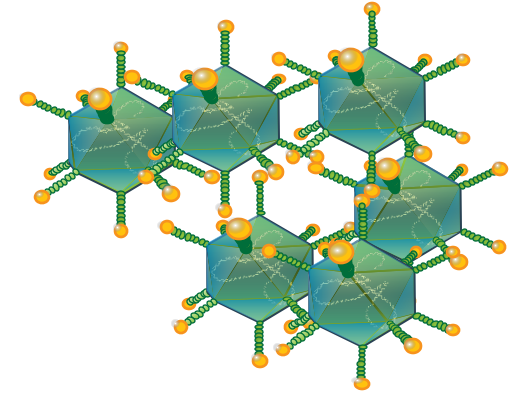
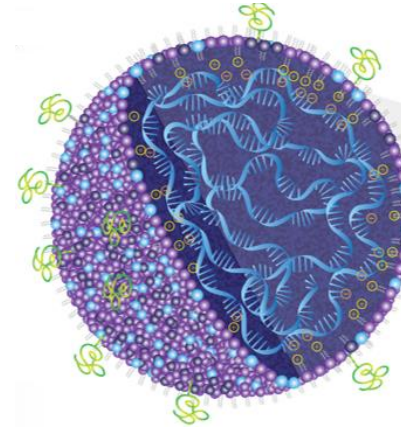
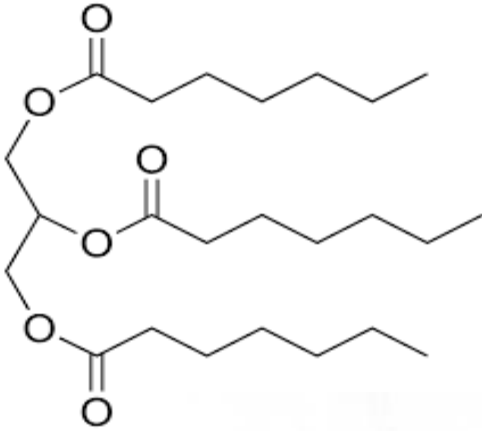
DNA and RNA base-pairing

Replication and Transcription



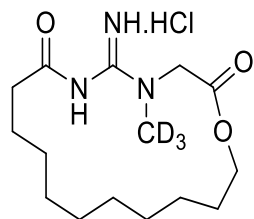
Modalities – what kind of medicines can we make?

Use the best medicine for the disease & drug target



Questions to consider during modality presentations

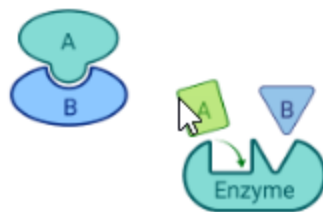
What is a Modality?



Small Molecule



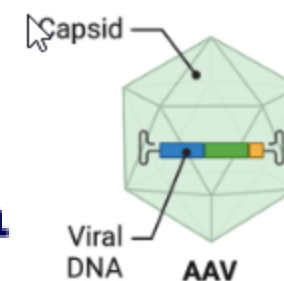
Antibody/ADC



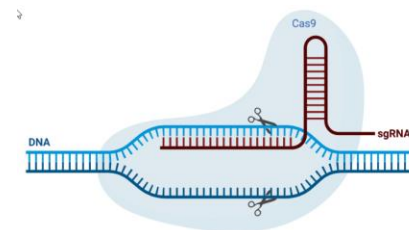
Enzyme/Protein



Nucleotide



Gene Therapy



Gene Editing

1. What has been clinically and/or preclinically demonstrated for a given modality?
2. What are the limitations of the modality (gene size, tissue target, etc.)?
3. What is the cost of development? Approximate time to a therapeutic?
4. What are the risks associated with the approach?



Thank You

