

Dec 17th, 2:00 PM

# Amyloid Protein Aggregation in Type-II Diabetes

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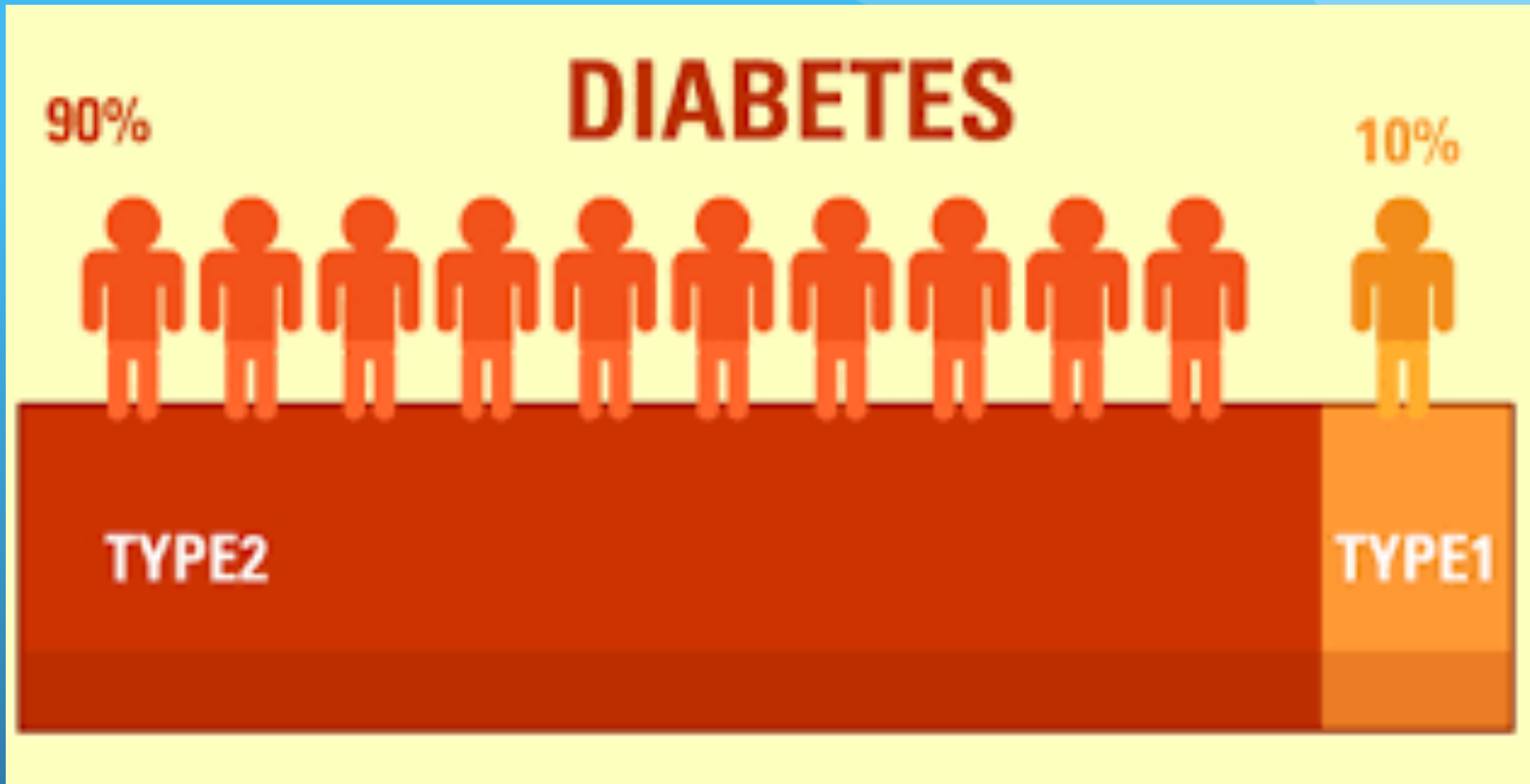
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Pilcher, Shannon M., "Amyloid Protein Aggregation in Type-II Diabetes" (2015). *Research & Exhibition*. 1.  
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# Amyloid Protein Aggregation in Type-II Diabetes

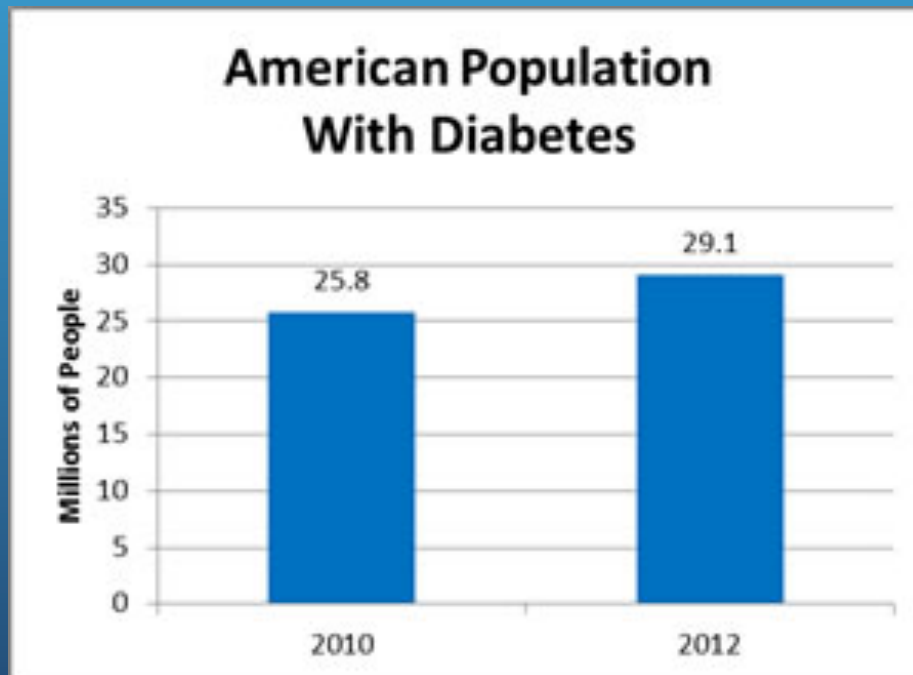
Shannon Pilcher  
Mentor: Dr. Moffet



Diet, Obesity, Genetics?

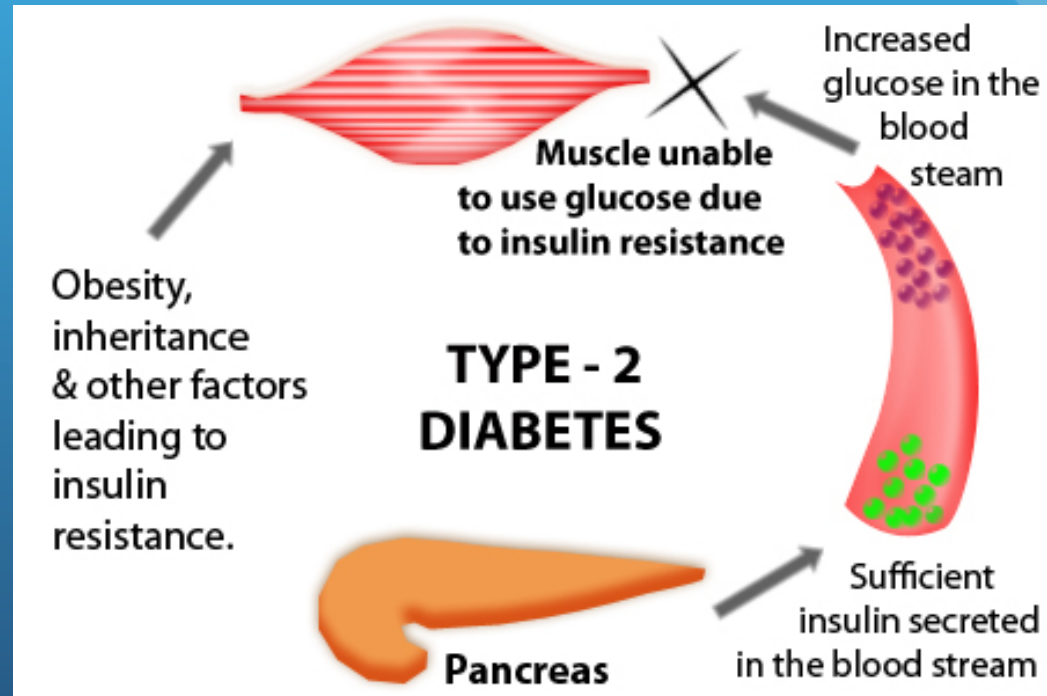
# Type-II Diabetes

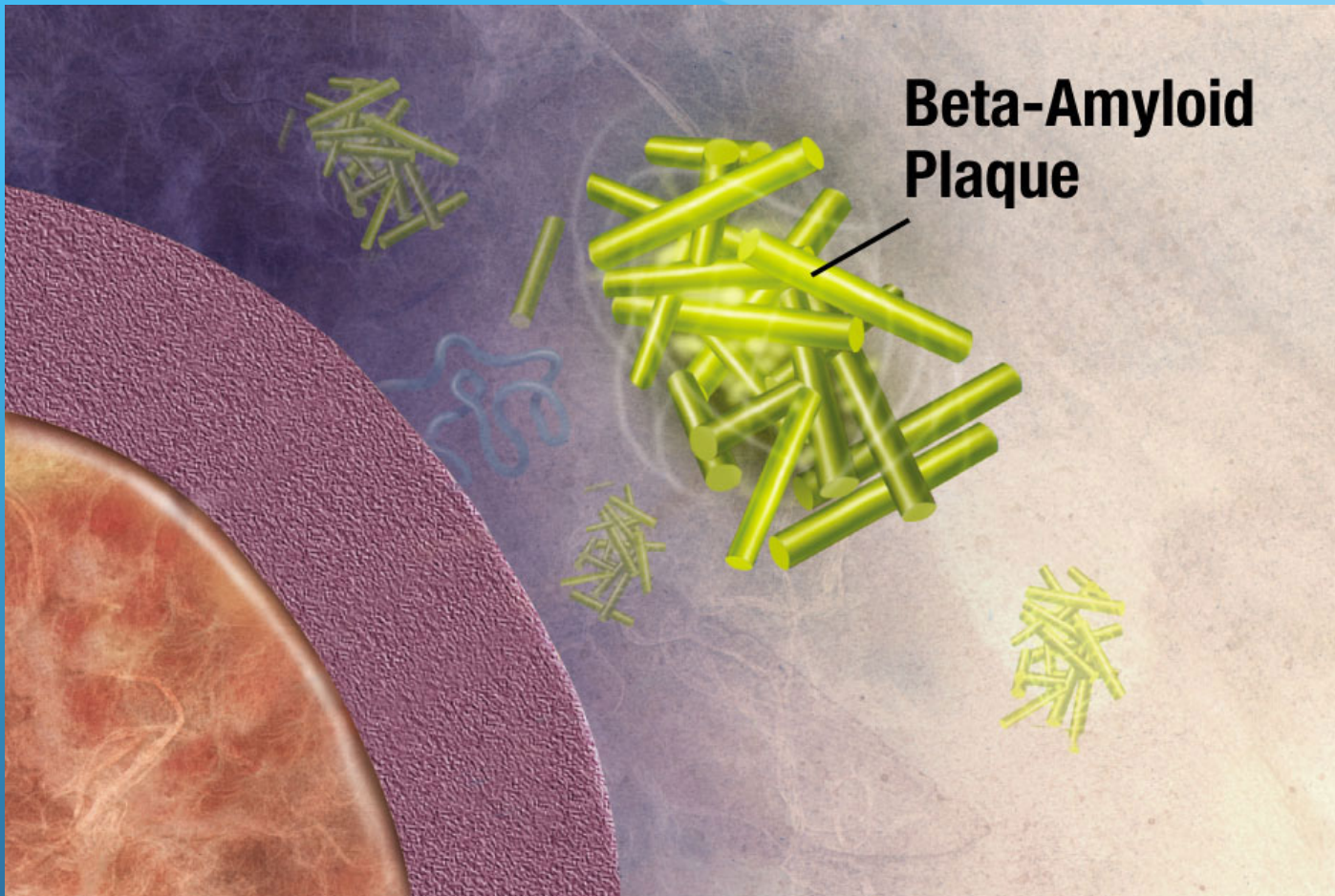
- According to American Diabetes Association...
  - 9.3% of population have diabetes
  - 37% of population in America has prediabetes
  - Economy cost: \$174 billion annually



# The Science of Diabetes...

- Diabetes is high glucose levels
- Insulin (which is hormone breaks down glucose) is depleted





- Beta cells: secrete insulin
- Amyloid Protein (IAPP) kills beta cells
  - Unable to secrete insulin = type-II diabetes

How can metal cation  
compounds inhibit the  
aggregation of the human  
protein IAPP?

# Metal Cation Compounds

- Examples:  $\text{CuCl}_2$ ,  $\text{ZnCl}_2$ ,  $\text{FeCl}_2$

## METHODS

- Add together metal compound, IAPP protein, and TRIS Buffer
  - TRIS Buffer = same pH as the body

Test aggregation of the protein alone, and test aggregation of protein with metal





# References

- Walsh *et al* (2002) Naturally secreted oligomers of amyloid beta protein potently inhibit hippocampal long-term potentiation in vivo. *Nature* 416(6880):535-9.
- Neddenriep, B., Calciano, A., Conti, D., Suave, E., Paterson, M., Bruno, E., Moffet, D.A. (2011). Short Peptides as Inhibitors of Amyloid Aggregation. *The Open Biotechnology Journal*, 39-46.
- Bruno, E., Pereira, C., Roman, K., Takiguchi, M., Kao, P., Nogaj, L., & Moffet, D. (n.d.). IAPP aggregation and cellular toxicity are inhibited by 1,2,3,4,6-penta- O -galloyl- $\beta$ - d -glucose. *Amyloid*, 34-38.
- Chiti, F., & Dobson, C. (n.d.). Protein Misfolding, Functional Amyloid, And Human Disease. *Annual Review of Biochemistry*, 333-366.