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# **Human Evidence: Environment and Gestational Diabetes**

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# Presentation Outline

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- I. Brief background
- II. Bisphenol-A and GDM
- III. Phthalates and Blood Glucose
- IV. Air Pollution and GDM

# Exposure to Environmental Chemicals

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- Exposure to environmental chemicals and metals are ubiquitous
  - Air, water, soil, food, consumer products
- US pregnant women exposed
  - 43 chemicals (NHANES, 2003-2004)

# Public Health Importance

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Environmental chemical exposure during pregnancy may exacerbate progression of gestational diabetes mellitus (GDM) and may contribute to developing type II diabetes mellitus after pregnancy

# The Environment and Diabetes

Thayer, K. A., Heindel, J. J., Bucher, J. R., & Gallo, M. A. (2012). Role of environmental chemicals in diabetes and obesity: a National Toxicology Program workshop review. *Environ Health Perspect*, 120(6), 779-789.

Kuo, C. C., Moon, K., Thayer, K. A., & Navas-Acien, A. (2013). Environmental chemicals and type 2 diabetes: an updated systematic review of the epidemiologic evidence. *Current diabetes reports*, 13(6), 831-849.

Taylor, K. W., Novak, R. F., Anderson, H. A., Birnbaum, L. S., Blystone, C., DeVito, M., ... & Lind, L. (2013). Evaluation of the association between persistent organic pollutants (POPs) and diabetes in epidemiological studies: a national toxicology program workshop review. *Environmental health perspectives*, 121(7), 774-783.

Everett, C. J., & Matheson, E. M. (2010). Biomarkers of pesticide exposure and diabetes in the 1999–2004 National Health and Nutrition Examination Survey. *Environment international*, 36(4), 398-401.

Howard, S. G., Heindel, J. J., Thayer, K. A., & Porta, M. (2011). Environmental pollutants and beta cell function: relevance for type 1 and gestational diabetes. *Diabetologia*, 54(12), 3168-3169.

# Type 2 Diabetes

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- Two defects are required for progression of type 2 diabetes
  - Defect in insulin secretion (pancreatic b-cell dysfunction)
  - Defect in insulin action (insulin resistance)