

## Birth to Three Institute Conference 2014

### Viewing Breastfeeding Beyond a Single Generation – The Potential Epigenetic Impact of Breastfeeding on Long-Term Health

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#### **Abstract:**

Recent research on epigenetics, literally meaning above the gene, has led medical professionals to query about how the environment impacts the developing baby both in utero and throughout its lifetime. The genome is the genetic information inherited from one's parents, but the epigenome is what deciphers the genome for each cell throughout the body. This deciphering process is impacted by both the internal and external environment of an individual. The external environment can include nutrition, chemicals, toxins, etc. The internal environment would include neuropeptides (emotional molecules) and stress hormones. The environment changes the proteins in the body that help the epigenome translate DNA. This finding has increased awareness of the importance of nutrition on the epigenome. Studies now are finding that the changes in the epigenome can influence not only that individual but can be passed along to future progeny, sometimes four generations out. The first nutrition for a human outside the womb is breastmilk, and thus its epigenetic impact is potentially expansive. New research has expanded the field of epigenetics to include breastmilk and how it potentially changes the epigenome and can affect the lifelong health of a baby. This presentation focuses on some of the latest published research- milksharing/wet nursing and the epigenome, breastmilk, and changes in gene expression and gut flora.

#### **Learning Objectives:**

- Define genome and epigenome.
- Identify at least one way breastmilk can potentially influence the epigenome of a baby.
- Identify one way that epigenetics can influence gut flora.

## **Outline:**

- 1.) What is epigenetics?
  - a. Genome=DNA
  - b. Epigenome=Phenotype
- 2.) How does epigenetics work?
  - a. Epigenome
  - b. Translator
  - c. Methylation
  - d. Histones
  - e. mRNA
- 3.) Developmental Origins
  - a. Metabolism
  - b. Hormone Production
  - c. Tissue Sensitivity
  - d. Growth and metabolism
  - e. The Microbiome
  - f. Inheritance based on environment
  - g. Animal research
  - h. Human research
- 4.) Breastfeeding and Epigenetics
  - a. Nutritional programming
  - b. Abundant resources, immune support, healthy food
  - c. Limited resources, immune challenge, poor nutrition
- 5.) Epigenetics and Human Studies Involving Breastmilk
  - a. Leptin Gene
  - b. Milk Kinship
  - c. Micro RNA in breastmilk
  - d. Formula and the epigenome
- 6.) Considerations for Practice

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