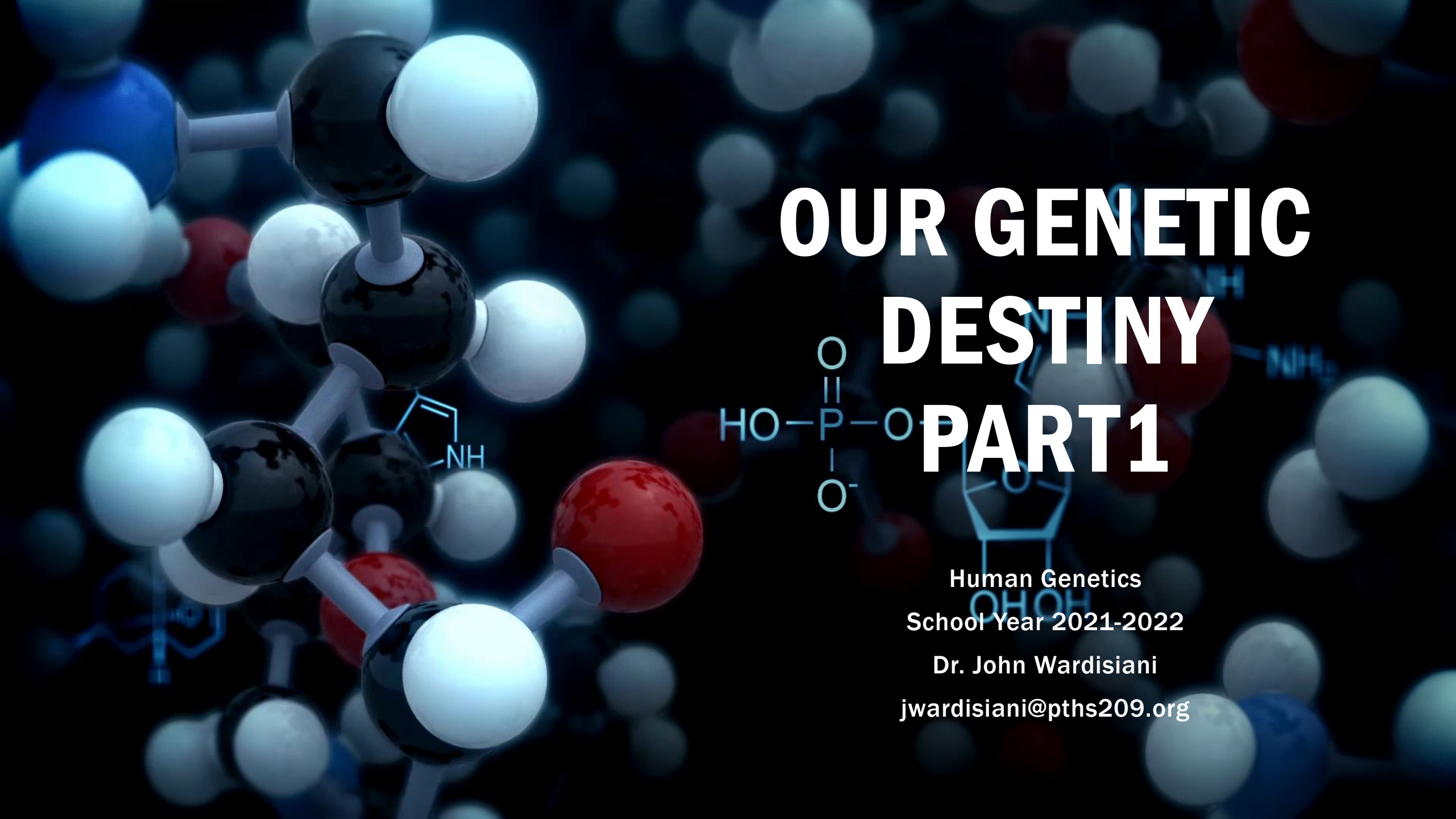

OUR GENETIC DESTINY PART1

Human Genetics

School Year 2021-2022

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OUR GENETIC DESTINY

- Not necessarily written in stone
- The environment in which a person is raised can trigger the expression of behavior where a person is genetically predisposed
- The same person raised in a different environment may exhibit different behavior
- Influenced by the following which also includes anything from light and temperature to exposure to chemicals
  - Social factors
  - Environmental factors

OUR GENETIC MAKEUP

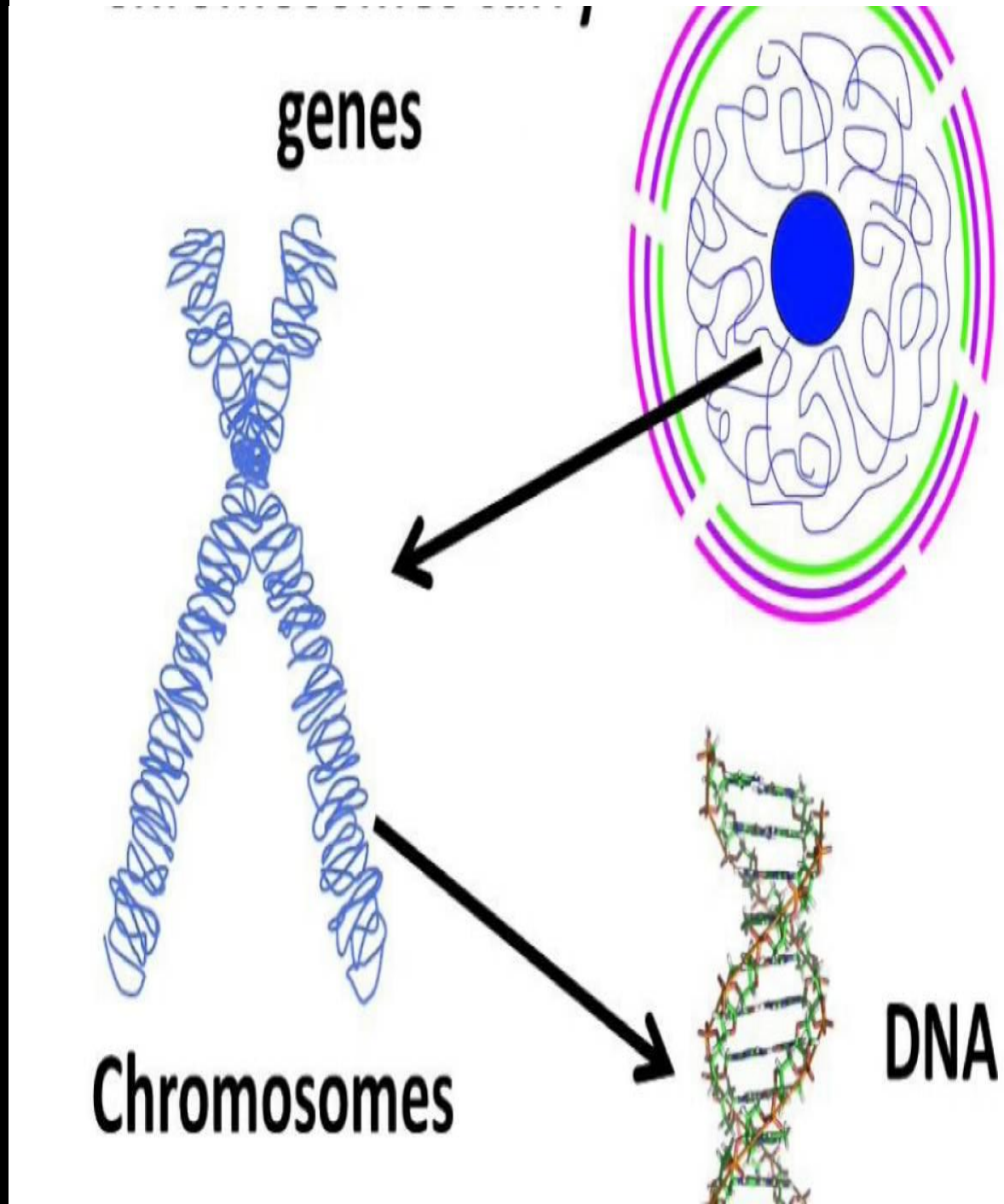
- Which factor is more important?
  - Genes or Environment
- Is a person destined to have a particular outcome in life because of his or her genetic makeup, or can the environment (and the people in it) work to change what might be considered “bad” genes?
- Today, it is generally agreed upon that neither genes nor environment work alone; rather, the two work in tandem to create the people we ultimately become

ENVIRONMENTAL ELEMENTS

- Light and temperature have been shown to induce certain changes in genetic expression
- Exposure to drugs and chemicals can significantly affect how genes are expressed
- People often inherit sensitivity to the effects of various environmental risk factors, and different individuals may be differently affected by exposure to the same environment in medically significant ways
  - For example, sunlight exposure has a much stronger influence on skin cancer risk in fair-skinned humans than in individuals with an inherited tendency for darker skin
- The color of a person's skin is largely genetic, but the influence of the environment will affect these genes in different ways

GENE ENVIRONMENTAL CORRELATIONS

- Passive
- Evocative
- Active



PASSIVE GENE ENVIRONMENTAL CORRELATIONS 1OF2

- An association exists between a person's genetic makeup and the environment in which he or she is raised
- The person's environment, particularly in the case of children, is largely determined by the parent's genetic characteristics
- Parents create a home environment that is influenced by their own heritable characteristics
- When the children's own genotype influences their behavior or cognitive outcomes, the result can be a misleading relationship between environment and outcome

	AB	Ab	aB	ab
AB	AABB	AABb	AaBB	AaBb
Ab	AABb	AAbb	AaBb	Aabb
aB	AaBB	AaBb	aaBB	aaBb
ab	AaBb	Aabb	aaBb	aabb

FOR EXAMPLE 2OF2

- An intelligent parent is likely to create a home environment rich in educational materials and experience
- Since intelligence is moderately heritable, it can be argued that intelligence in the child is inherited rather than a factor of the home environment created by the parents
- It is relatively unclear whether the genetic or environmental factors had more to do with the child's development.

EVOCATIVE GENE ENVIRONMENTAL CORRELATIONS

- Happens when an individual's (heritable) behavior evokes an environmental response
- For example, the association between marital conflict and depression may reflect the tensions that arise when engaging with a depressed spouse rather than a causal effect of marital conflict on risk for depression

ACTIVE GENE ENVIRONMENTAL CORRELATIONS

- The person's genetic makeup may lead them to select particular environments
- For example, a shy person is likely to choose quiet activities and less boisterous environments than an extroverted individual. He or she may be more likely to spend time at the library than at a dance club

ADOPTION AND TWIN STUDIES
NATURE VS. NURTURE DEBATE 10F2

- Adoption and twin studies can help make sense of the influence of genes and the environment
- Studies of adult twins are used to investigate which traits are heritable. Identical twins share the same genotype, meaning their genetic makeup is the same
- Twins raised apart tend to be similar in intelligence and, in some cases, life events and circumstance, when studied years later, even when raised separately

ADOPTION AND TWIN STUDIES
NATURE VS. NURTURE DEBATE 20F2

- However, researchers have discovered that the phenotype (or the observable expression of a gene) of identical twins grows apart as they age
- In adoption studies, identical twins raised by different families can give insight into the nature-versus-nurture debate
- Since the child is being raised by parents who are genetically different from his or her biological parents, the influence of the environment shows in how similar the child is to his or her adoptive parents or siblings
- Adoption studies make a strong case for the influence of environment, whereas twin studies make a strong case for genetic influence

THANK YOU!

Questions and Comments