

Program: Pleased to Meet Me: How Genes, Germs, and the Environment Make Us Who We Are

Speakers: Bill Sullivan, Ph.D., Showalter Professor of Pharmacology, Toxicology, Microbiology, & Immunology, IU School of Medicine

Introduced by: Alison Brown

Attendance: 152

Guests: Dvard Ballara, Mike Ertel, Marilyn Fairey, Mark Clayton Jonis, Pat Kelly, Susan Kenniger, Steve Lambert, Rosemarie Menapace, Helen Murphy, Joe Murphy, John Nusbaum, Aleksandsol Ojewigz, Philip Sowders, David Zauner

Scribe: Don Mink

Editor: Jim Willson

Dr. Sullivan introduced his presentation by introducing his book: *PLEASED TO MEET ME:*

Genes, Germs, and the Curious Forces That Make Us Who We Are. Where do my moods come from? Why do I vote the way I do? Why didn't I think of that? Why don't I like certain foods? Why do I always fall for a certain "type"? You are not who you think you are. You are under the influence of hidden forces. Exposing these forces will help you live a better life.

Hidden Force #1: Genes. Just how important is DNA to how we define ourselves? If we knew your DNA sequence...could we predict your behavior? Bradley Waldroup (2009) was the first person to be spared the death penalty for murder because of his genes. His MAO-A gene variant (the "warrior" gene) is linked to violent behavior and intermittent explosive disorder (IED), especially if abused as a child. Genes and violence – should we prescreen and treat people before crime can happen? Sweat from men with different immune system genes is more attractive to women. DRD4 (dopamine receptor) variant 7R are "daredevils" – novelty-seekers, risk-takers, more common in progressives/liberals.

Hidden Force #2: Epigenetics. Epigenetics control gene activity. "**Epigenetics**, as a **definition**, is the study of biological **mechanisms** that will switch genes on and off. What does that mean? Well, if you are new to this whole thing, we first need a quick crash course in biochemistry and genetics before learning exactly what is **epigenetics**. (Scribe's Note)" Environment influences gene activity via epigenetic mechanisms. Genes are the piano keys...but the environment plays the song. Dr. Sullivan provided examples of different characteristics in identical twins due to gene variation; and in a research project that demonstrated that by altering gene expression through epigenetics, researchers were able to reprogram an ant's behavior. Your cravings, fears, what makes you happy...are "self-defining" traits pre-programmed into DNA by your (grand)parents' environment.

Hidden Force #3: Subconscious: Genetic influences on the brain include suicide, schizophrenia, OCD, memory skills, and intelligence. Evolutionary ghosts haunt our

brain. Despite our bells and whistles, we are strongly influenced by the primal urges to survive and reproduce. Injury, surgery, tumors, toxins, infection, old age, and medication can also influence our brain.

Hidden Force #4: Microbes: Microbiome can alter brain activity – over 3 pounds of microbes, and their viruses, are in and on you. Transfer of Microbiome from an external source can change physical characteristics and mental state. Toxoplasma (a microbe gifted to us by cats) has been linked to schizophrenia, rage disorder (IED), risk-taking, anxiety, and increased car accidents.

Meet Your Future: All of our actions have a biological basis! Understanding this can lead to future developments such as gene editing, epigenetic drugs, environmental engineering, remodeling the microbiome, and brain-computer interfaces.



Dr. Bill Sullivan