**Research Day 2017**

***Featured Speaker – 21st Annual Roy H. Behnke, MD Distinguished Lectureship***

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**Invisible Influence: The Microbiome and Human Health**

The human microbiome is quickly being recognized as a dynamic part of the human ecosystem, and research is starting to demonstrate that using ecology to understand this ecosystem has profound benefits for patient wellness. The immune system controls our interaction with the microbial world, and yet the microbial communities in our bodies are central to modulating the immune response. Changes in the human microbiome have substantial influence on atopy, neurological disorders, metabolic disorders, and a range of complex conditions and disease states. We will discuss evidence of these mechanisms of interaction and how we have started to disturb the delicate balance of the immune-microbe equilibrium, impacting the development and function of our immune systems. Central to this disturbance is the distance we have placed between our children and the microbial world, which has been demonstrated to have a substantial influence on their physiological, immunological, neurological and even endocrinological development. We are now able to significantly reduce cow’s milk allergy in infants through active manipulation of the gastrointestinal microbiota. We can also reduce surgical infections by feeding the microbiome, preventing virulence activation, and reduce sepsis by using the microbiome to stimulate immune activation. Applying new strategies to identify how the microbial ecosystem correlates with diseases states and treatment efficacy through Microbiome-Wide Association Studies (MWAS) is altering the trajectory of precision medicine, and providing a new framework for facilitating patient care.