



**STATISTICS DEPARTMENT SEMINAR**

**Barbara Bailey, Ph.D.**  
**Professor**

**San Diego State University**  
**San Diego, CA**

**Olmsted Hall 420**

**April 16<sup>th</sup>, 2019**

**3:45-4:45pm**

*Reception in Olmsted 1331  
at 3:15 P.M.*



**“CHARACTERIZING AND CLUSTERING  
AN ADULT CYSTIC FIBROSIS PATIENT  
POPULATION USING LONGITUDINAL  
LUNG FUNCTION MEASUREMENTS”**

FOR MORE INFORMATION ABOUT THIS SEMINAR, VISIT [STATISTICS.UCR.EDU/COLLOQUIA.HTML](http://STATISTICS.UCR.EDU/COLLOQUIA.HTML)

## Abstract

Cystic Fibrosis (CF) is a multi-systemic disease resulting from mutations in the Cystic Fibrosis Transmembrane Regulator (CFTR) gene and has major clinical manifestations in the sino-pulmonary and gastrointestinal tracts. Adult CF patient longitudinal lung function data are used to describe and characterize the dynamics of lung function over time. We fit quantile splines and estimate the rate of change of the lung function over time. The estimated derivatives, along with corresponding summary statistics are used for patient clustering. In addition, clinical phenotyping is important for identifying disease prognosis, responses to therapy, genomic/genetic risk assessment and for metabolomic studies.

Informative groupings are identified using a proximity matrix generated by unsupervised Random Forests and clustering by Partitioning around Medoids (PAM).

## Biography

Dr. Bailey is an Associate Professor in the Statistics Division at San Diego State University. She earned a Ph.D. in Biomathematics from North Carolina State University and was a postdoctoral researcher at the National Center for Atmospheric Research.