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# ABSTRACT

**CHAPTER 1**

**PRIMER ON EXACT BAYESIAN METHODS AND**

**VARIATIONAL INFERENCE**

**CHAPTER 2**

**VARIATIONAL INFERENCE OF IMMUNOGENIC TUMOR**

**SUBSTRUCTURE**

**CHAPTER 3**

**A BAYESIAN APPROACH FOR INFERRING NEURONAL  
CONNECTIVITY FROM  $Ca^{2+}$  IMAGING DATA AND  
MONTE CARLO SIMULATIONS**

**CHAPTER 4**

**BAYESIAN INFERENCE OF THE KINETIC PARAMETERS  
OF INTERFERON-GAMMA INDUCED TRANSCRIPTION**