

Statistical Modeling in Non-invasive prenatal screening

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Abstract: The landmark discovery of fetal cell-free DNA in maternal peripheral blood in 1997 laid the foundation for non-invasive prenatal screening (NIPS). In practice, Z-score is the prevailing method used in NIPS. However, the strict yet clear statistical basis for the NIPS area is still limit. In this talk, I will discuss how to develop the statistical modeling framework for the NIPS , and develop a novel noninvasive prenatal diagnosis method. Under the proposed modeling framework, we provide theoretical answer to a series of questions arisen in NIPS. We also use simulation and real data analysis to show that our proposed method can substantially reduce the false negative rate for the samples with low fetal fraction.