

FREIE UNIVERSITÄT BERLIN

Fachbereich Mathematik und Informatik

Promotionsbüro, Arnimallee 14, 14195 Berlin

D I S P U T A T I O N

Montag, 19. Dezember 2022, 13:00 Uhr

Ort: [WebEx](#)

Disputation über die Doktorarbeit von

Frau Annkatrin Sarah Bressin

Thema der Dissertation:

A Multi-Omics Analysis of Transcription Control by BRD4

Thema der Disputation:

Testing statistical models on RNA-seq and NET-seq data

Die Arbeit wurde unter der Betreuung von **Prof. Dr. M. Vingron** durchgeführt.

Abstract: High-throughput sequencing technologies, such as RNA-sequencing (RNA-seq), are constantly used in quantitative transcriptomics studies. Our understanding of transcriptional regulation depends on our ability to identify differentially expressed genes, for example, between healthy and diseased individuals.

All standard tools rely on theoretical models to estimate the read-count variability and to differentiate technical from biological variability. Using a comprehensive 48-replicate RNA-seq experiment, Gierliński and colleagues [1] tested different statistical models where the observed gene read counts were consistent with the negative binomial distribution. However, it remains unclear if the negative binomial distribution sufficiently describes also other types of transcriptomic HTS data, such as native elongating transcript sequencing (NET-seq).

NET-seq measures RNA Polymerase II (Pol II) occupancy and allows to study Pol II regulation. For this talk, I adapted the approach from Gierliński et al. and tested different statistical models for NET-seq. Identifying suitable statistical models for NET-seq is crucial to detect reliable changes in Pol II genome transcription.

[1] Marek Gierliński et al. "Statistical models for RNA-seq data derived from a two-condition 48-replicate experiment." In: *Bioinformatics* 31.22 (2015), pp. 3625–3630

Die Disputation besteht aus dem o. g. Vortrag, danach der Vorstellung der Dissertation einschließlich jeweils anschließenden Aussprachen.

Interessierte werden hiermit herzlich eingeladen

Der Vorsitzende der Promotionskommission
Prof. Dr. M. Vingron