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*Spatial Statistical Tools for Genome-Wide Mutation Thundershower Detection under a Microarray Probe Sampling System*

In genetics, the study of mutation showers can help better understand mutagenic mechanisms. A cost-effective method is to use an organism specific genotyping array that is designed to detect mutations at defined sites on probes across the entire genome. Mutations at non-probe sites are unobserved. To establish formal statistical tools for genome-wide mutation detection, several test statistics are proposed and are based on the probe array spatial properties. Power performance of the test statistics are evaluated under Neyman-Scott clustering processes via Monte Carlo simulation. Statistics with good performance are recommended as screening tools for geneticists.