Docket #: S19-524

Simultaneous Detection of Microsatellite and Chromosomal Instabilities Using Different Classes of Tandem Repeats and Cancer Gene Targets

The Ji lab has developed a sequencing assay to provide genetic diversity information of microsatellite and chromosomal instability (MSI) in colorectal cancer. MSI arises from a loss of DNA mismatch repair in colorectal cancers, making them genetically diverse. In order to capture the full array of MSI tumors, this assay accounts for varied intensity of MSI, different classes of instability sources, and overlaps with other types of genetic instabilities such as chromosomal instability (CIN) that current assays do not provide. By sequencing >200 microsatellite regions in parallel, this method evaluates not only mono- and dinucleotide repeat classes, but also tri- and tetranucleotide repeats while simultaneously identifying CIN. In a set of 51 colorectal cancers, researchers were able to identify 14 MSI tumors of varying intensity and instability in different classes. These assays provide a broader scope of information and can help predict patient response to immunotherapy treatments.

Stage of Research

- Proof of concept

Related technologies:
Stanford Docket S10-233-"Fast, drect DNA capture and sequencing"
Stanford Docket S15-164-"STR-Seq: a technology for massively parallel STR sequencing and genotyping"

Applications

- **Colorectal cancer MSI diagnostics**
- Predicting patient response to immunotherapy treatment

Advantages

- **Sequences 6305 single primers**
- High accuracy: over 200 microsatellite markers
- Applicable to genetic diversity of all MSI tumors
- Simultaneously indicated CIN status

Patents

- Published Application: WO2021127267
- Published Application: 20220316015

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