

江培勇

PEIYONG JIANG



Prof. Peiyong Jiang  
Chemical Pathology



# 12 GENOMICS AND BIOINFORMATICS



**Principal Investigator**  
Peiyong Jiang



**Team members**  
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## Research Progress Summary

Peiyong Jiang and his team continue the efforts to identify new biological properties of cell-free DNA such as plasma DNA end motifs, jagged ends, and circular cell-free DNA molecules, and develop new diagnostic tools based on sequencing technologies. They established the academic collaboration with the Broad Institute

of MIT and Harvard, published a study related to single-cell meta-analysis of SARS-CoV-2 entry genes across tissues and demographics in Nature Medicine. They continue the collaboration with Wayne Luk, from the Department of Computing at Imperial College London. They filed two patent applications in 2021.



## Research and Scholarship

### Fellowships

| Member's Name | Details       |                               |
|---------------|---------------|-------------------------------|
|               | Fellowship    | Organisation                  |
| Peiyong Jiang | Senior Member | National Academy of Inventors |

### Grants and Consultancy

| Name          | Project Title        | Funding Source  | Start Date (dd/mm/yyyy) | End Date (dd/mm/yyyy) | Amount (HK\$)              |
|---------------|----------------------|---|-------------------------|-----------------------|----------------------------|
| Peiyong Jiang | Centre for Novostics | Innovation and Technology Commission – Innovation and Technology Fund | 01/05/2020              | 01/05/2025            | Amount not to be disclosed |

### Publications

#### A. Journal Papers

1. Yu SCY, Jiang P, Peng W, Cheng SH, Cheung YTT, Tse OYO, Shang H, Poon LC, Leung TY, Chan KCA, Chiu RWK, Lo YMD. Single-molecule sequencing reveals a large population of long cell-free DNA molecules in maternal plasma. *Proceedings of the National Academy of Sciences*. 2021;118(50):e2114937118. doi:10.1073/pnas.2114937118.
2. Vong JSL, Ji L, Heung MMS, Cheng SH, Wong J, Lai PBS, Wong VWS, Chan SL, Chan HLY, Jiang P, Chan KCA, Chiu RWK, Lo YMD. Single cell and plasma RNA sequencing for RNA liquid biopsy for hepatocellular carcinoma. *Clinical Chemistry*. 2021;67(11):1492-1502. doi:10.1093/clinchem/hvab116.
3. Sin STK, Ji L, Deng J, Jiang P, Cheng SH, Heung MMS, Lau CSL, Leung TY, Chan KCA, Chiu RWK, Lo YMD. Characteristics of fetal extrachromosomal circular DNA in maternal plasma: Methylation status and clearance. *Clinical Chemistry*. 2021;67(5):788-796. doi:10.1093/clinchem/hvaa326.
4. Lo YMD, Han DSC, Jiang P, Chiu RWK. Epigenetics, fragmentomics, and topology of cell-free DNA in liquid biopsies. *Science*. 2021;372(6538). doi:10.1126/science.aaw3616. (Review)
5. Zhou Z, Cheng SH, Ding SC, Heung MMS, Xie T, Cheng THT, Lam WKJ, Peng W, Teoh JYC, Chiu PKF, Ng CF, Jiang P, Chan KCA, Chiu RWK, Lo YMD. Jagged ends of urinary cell-free DNA: Characterization and feasibility assessment in bladder cancer detection. *Clinical Chemistry*. 2021;67(4):621-630. doi:10.1093/clinchem/hvaa325.

6. Gai W, Zhou Z, Agbor-Enoh S, Fan X, Lian S, Jiang P, Cheng SH, Wong J, Chan SL, Jang MK, Yang Y, Liang RHS, Chan WK, Ma ESK, Leung TY, Chiu RWK, Valentine H, Chan KCA, Lo YMD. Applications of genetic-epigenetic tissue mapping for plasma DNA in prenatal testing, transplantation and oncology. *eLife*. 2021;10. doi:10.7554/elife.64356.
7. Tse OYO, Jiang P, Cheng SH, Peng W, Shang H, Wong J, Chan SL, Poon LCY, Leung TY, Chan KCA, Chiu RWK, Lo YMD. Genome-wide detection of cytosine methylation by single molecule real-time sequencing. *Proceedings of the National Academy of Sciences of the United States of America*. 2021;118(5). doi:10.1073/pnas.2019768118.
8. Ma MJL, Yakovenko S, Zhang H, Cheng SH, Apryshko V, Zhavoronkov A, Jiang P, Chan KCA, Chiu RWK, Lo YMD. Fetal mitochondrial DNA in maternal plasma in surrogate pregnancies: Detection and topology. *Prenatal Diagnosis*. 2021;41(3):368-375. doi:10.1002/pd.5860.

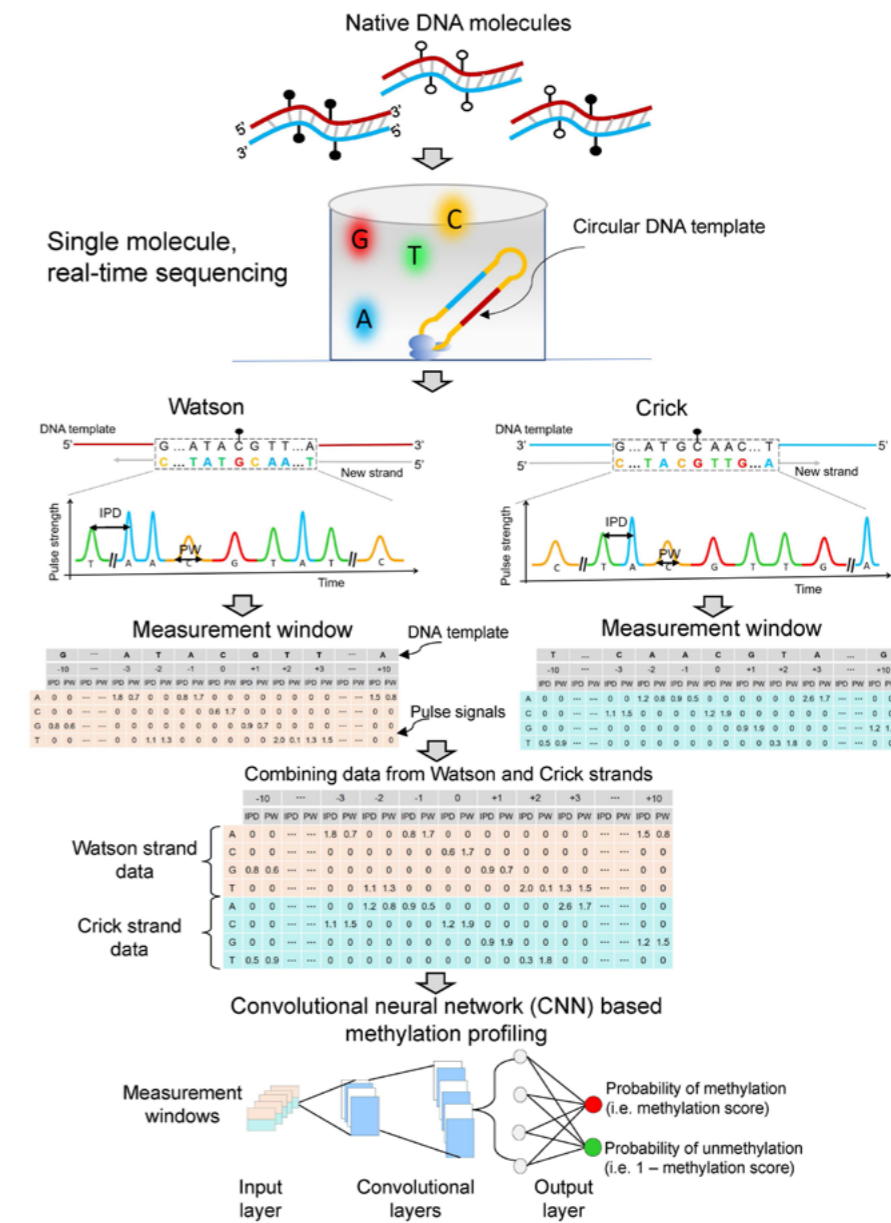


Fig. 1

Schematic 5mC detection using single molecule sequencing and the HK model

Source: PNAS (<https://www.pnas.org/content/118/5/e2019768118>)