Scientists develop new analytical method

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A multidisciplinary team at Israel's Weizmann Institute of Science says it has developed a new analytical method that can trace the lineage of cells. The scientists say they hope their work will lead to answers for such questions as: "Where do stem cells originate?" and "How does cancer develop?"

The accomplishment started with a challenge to common wisdom, which says every cell in an organism carries an exact duplicate of its genome. Although mistakes in copying occur when cells divide -- with the errors passed to the next generation of cells as mutations -- such tiny flaws in the genome are thought to be trivial and mainly irrelevant.

But research students Dan Frumkin and Adam Wasserstrom of the Institute's Biological Chemistry Department, under the guidance of Professor Ehud Shapiro, raised a new possibility: although biologically insignificant, the accumulated mutations might hold a record of the history of cell divisions.

Together with Professor Uriel Feige and research student Shai Kaplan, they proved such mutations can be treated as information and used to trace lineage on a large scale.

Their findings are detailed in the current issue of the journal PLoS Computational Biology.