Optical Microscopy and Image Analysis at the National Cancer Institute - Frederick with emphasis on validation

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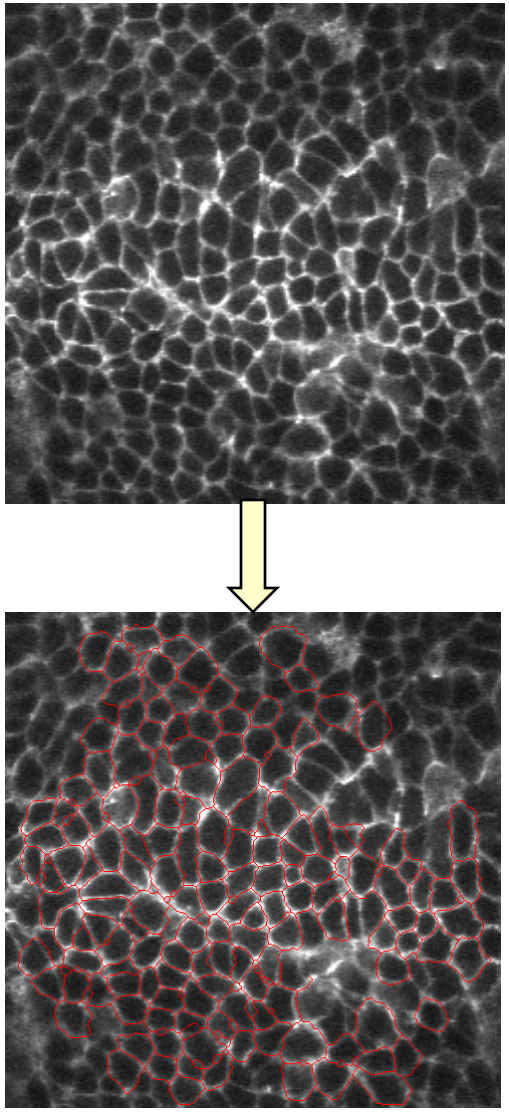
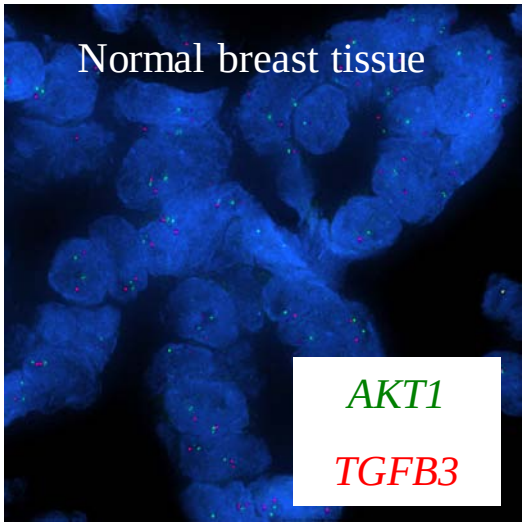
Single Cell Analysis in Tissue

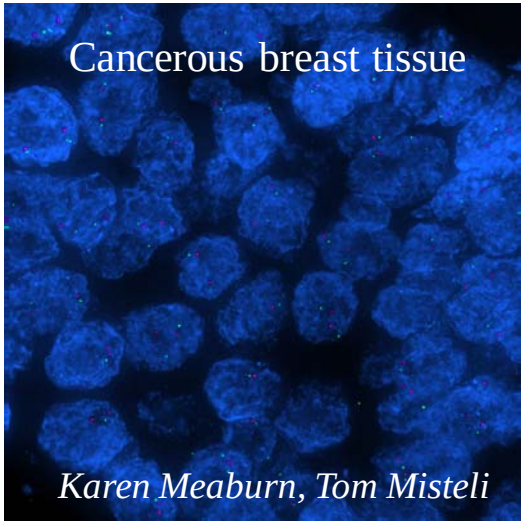
- Altered cell-cell communication in tissue underlies carcinogenesis of solid tumors.
- Thus understanding cancer mechanisms requires analysis at the individual cell level, while cells remain in their tissue context
- *Efficient, interactive tools for whole cell segmentation (2D and 3D).*
- *Automatic tools for nuclear segmentation (3D).*
  Altered cell-cell communication in tissue underlies carcinogenesis of solid tumors.
- *Software available for licensing, not patented*



Gene Position Analysis in Breast Cancer

- Certain genes position differently in the interphase nuclei of cancer cells versus normal cells. Cannot detect the differences visually
- Requirements: (1) analysis of individual cell nuclei; (2) automation





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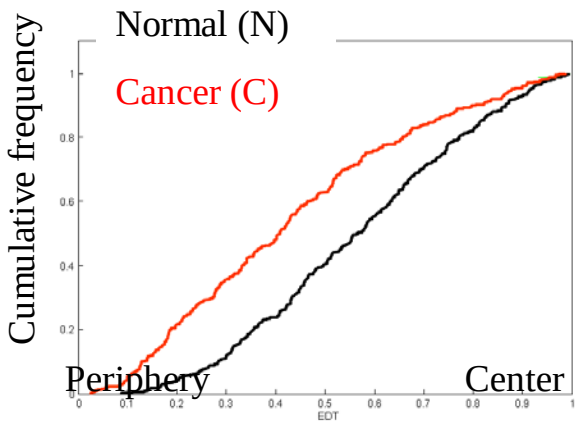
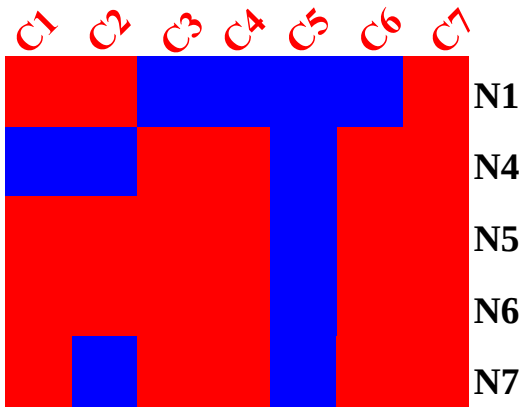




Commercial Applications

- Improvements over existing methods:

  (1) Quantitative at the single cell level.

  (2) Higher throughput.

  (3) Greater in depth understanding of molecular mechanisms driving tissue development, tissue homeostasis and what goes wrong in cancer.

  (4) Potentially, a new diagnostic for cancer.

- Anticipated markets:

  (1) Cancer diagnostics

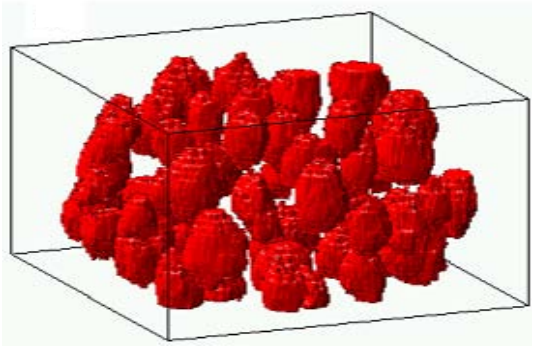
  (2) Software companies interested in marketing to biology researchers.

Collaboration Opportunities

- Future:

  (1) Extensive validation for specific biological and clinical applications.

  (2) New application areas: high throughput drug screening



- Our Goal:

  (1) To prove feasibility of our basic research, and then to translate it to the clinic, as well as back to the research lab as commercial products.

Contact Information

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