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).


- 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

*AKT1*

![Image of Normal and Cancerous breast tissue with AKT1 and TGFB3 genes highlighted]
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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