Site-Specific Chemical Mapping of Individual Cells in Two and Three Dimensions with Imaging Mass Spectrometry

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in collaboration with:
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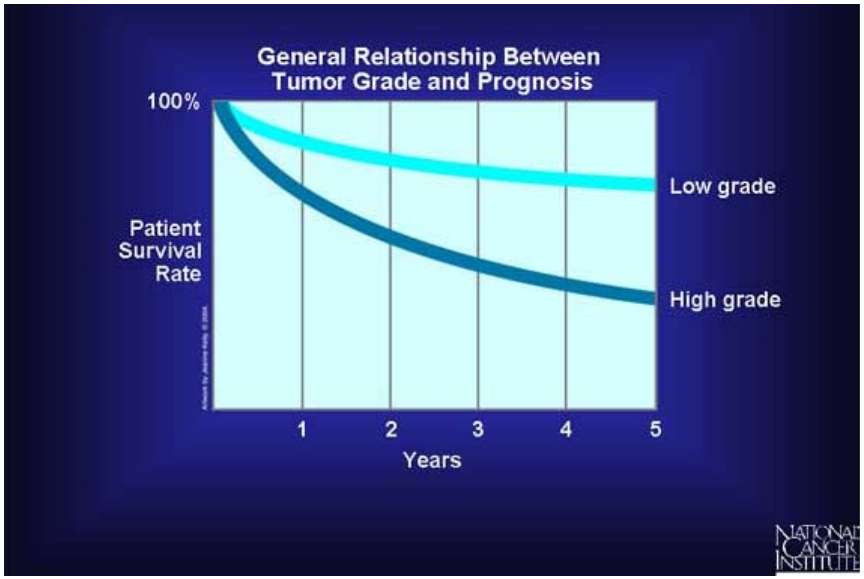
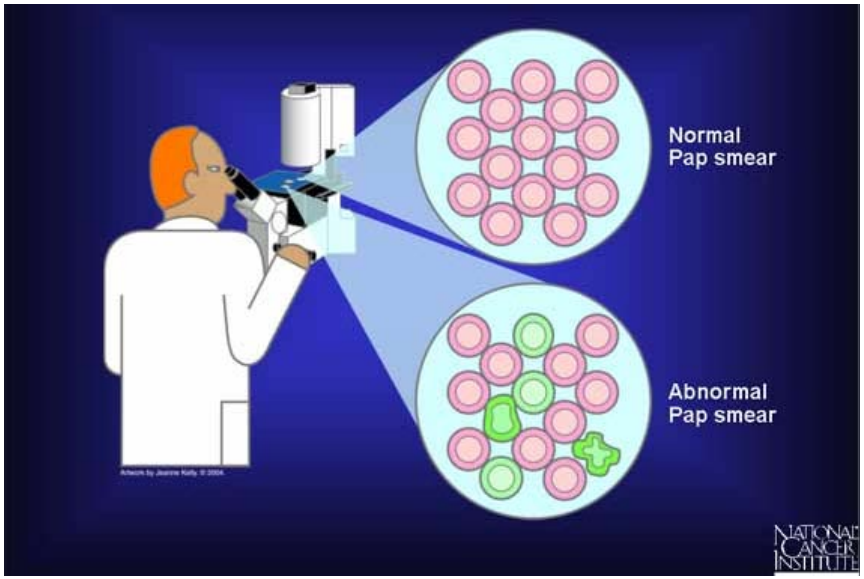
Technology (Current)

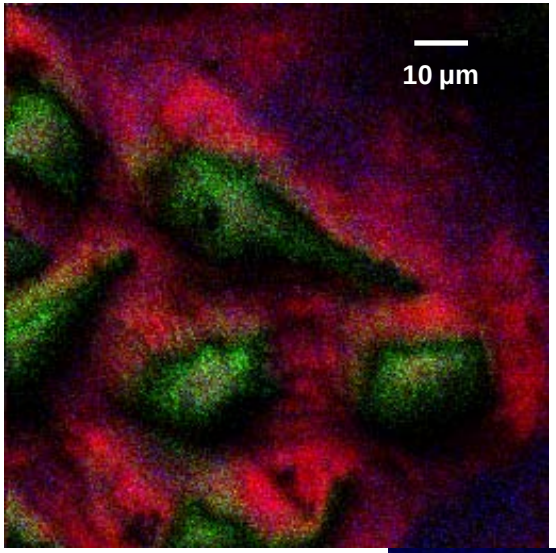
- Conventional pathology involves visual inspection of suspected tissue – this requires the cancer to advance to a stage where abnormal cell growth is already manifested
- Visual observation of internal or external biopsies performed by optical microscopy
- The changes in chemistry at the root of abnormal cell growth are not detected – the early detection schemes currently employed are not early enough

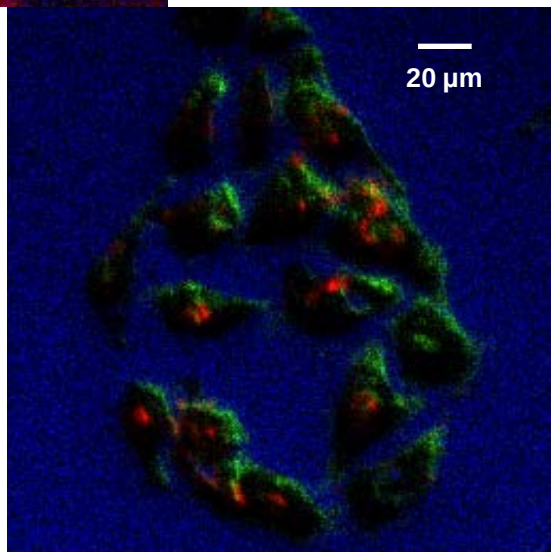


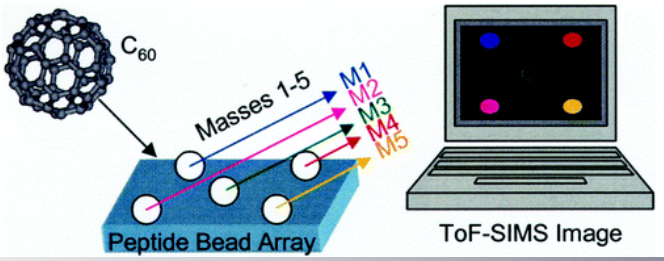


Technology (New)

- Utilize power of Secondary Ion Mass Spectrometry (SIMS) for imaging chemical manifestations of cells
  - surface-sensitive to a few atomic layers in any one spectrum/image
  - lateral imaging resolution of < 500 nm
  - depth profiling resolution on order of 10-20 nm
- Site-specific mapping of molecules and elements – use to track disease



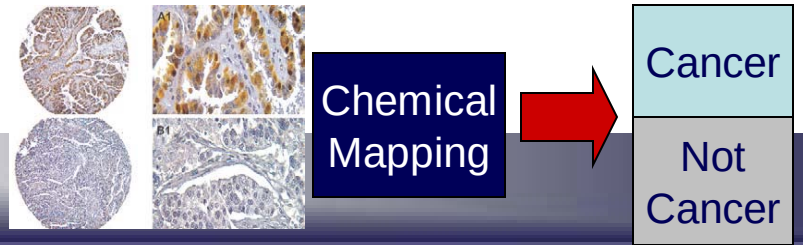




Technology Applications

- Use methods developed between NIST and NIH/NCI to map chemical manifestations of individual cells for myriad of possibilities, including drug efficacies

- R & D to lead to earlier recognition of disease progression and provide “chemistry” to the classic histology information
  - improve reliability of cancer diagnoses
  - generate knowledge of diseases and cell processes



Commercial Applications

- Provide and develop standard methods and tools for researchers to enable scientific discovery

- Development of instruments to augment or even replace histological examinations for cancer diagnoses in hospitals and clinics everywhere
  - HIGH RISK & IMPACT!
  - Lower costs
  - Save lives
  - Cancer or not in seconds

Collaboration Opportunities

- Yes!
- We welcome collaborations to improve the measurement science capabilities of site-specific chemical mapping of disease progression

- At present, no concrete details on CRADA or SBIR agreements, etc. are available, however we're open to discussions

Contact Information

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