Next Generation Anatomical Pathologists

Molecular Pathology in Anatomical Pathology Training

Wendy McBurnie
Senior Anatomical Pathology Registrar
Canterbury District Health Board
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Background

- Changing world of pathology
  - Diagnostics to Therapeutics
  - Research and Advances = Better understanding
- More information is now required from tissue for patient management
- New diagnostic standard
- Significant blurring of the boundaries between Anatomical and Molecular pathology
Goals

- Goals:
  - To equip future practising pathologists with basic knowledge of molecular diagnostics
  - To provide subspecialty experience in tissue molecular diagnostics
  - To help retain trainees; and
  - To encourage a wider range of applicants
Future

- Histopathologists can combine:
  - Clinical
  - Macro- and microscopic findings; and
  - Molecular information

- Complete therapeutic and prognostic diagnoses can be provided

- Widening career options for Histopathologists
  - Academic
  - Clinical
  - Commercial
Molecular training in AP training
Current Training Outline

Year 1
- Basic Pathological Sciences Exam

Year 2

Year 3
- Part 1 Exam
  Written and slide exam

Year 4
- Optional:
  Small biopsy and special techniques exam, and
  Cytology exam

Year 5
- Part 2 Exam
  Slide exam, Small biopsy and special techniques exam, Cytology exam, and Structured VIVA

Canterbury Health Laboratories
www.chl.co.nz | 0800THELAB
New Zealand training centres

- Auckland
- Hamilton
- Tauranga
- Palmerston North
- Wellington
- Christchurch
- Dunedin
Incentives

- Trainee
  - Increased Knowledge
  - Future practice
  - CV improvement

- DHB and Lab
  - Employment retention
  - Increased applications for training
Canterbury Health Laboratories
Proposed Training Outline

1st Placement

Year 1
- Basic Pathological Sciences Exam

Year 2

Year 3
- Part 1 Exam
  Written and slide exam

Year 4
- Optional: Small biopsy and special techniques exam, and
  Cytology exam

Year 5
- Part 2 Exam
  Slide exam, Small biopsy and special techniques exam, Cytology exam, and
  Structured VIVA
Proposed placement curriculum

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<th>1st Placement</th>
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<tbody>
<tr>
<td>DNA</td>
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<tr>
<td>RNA</td>
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<tr>
<td>Proteins</td>
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<td>Extraction methods</td>
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<td>PCR</td>
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<td>Analysis and characterisation of NA</td>
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<td>Nucleic acid amplification</td>
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<td>Gene mutations</td>
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<td>DNA sequencing</td>
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<td>Molecular oncology</td>
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<td>High-throughput technologies</td>
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<td>Validation and optimisation procedures</td>
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<td>Quality control and quality assurance</td>
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<td>Use of human tissues for research</td>
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<td>Core skills in DNA extraction</td>
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<table>
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<th>2nd Placement</th>
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<td>Knowledge and skills in core molecular technologies and techniques</td>
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<td>Expertise in the molecular pathology of common cancers i.e breast, colorectal, lung, melanoma, sarcoma, thyroid, CNS, and paediatric tumours</td>
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<td>Research</td>
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<td>Leadership and management</td>
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<td>Training and education</td>
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My Experience

- Commenced January 2015
- Steep learning curve
- Back to basics
- Opportunities

https://flipboard.com/@cgarza77/confused-vvgdt05z
https://www.dashingd3js.com/about
http://www.josephdworak.com/time-flies-fun/
Her2 FISH

H&E: http://www.modernmedicaldictionary.com/overview-terms/pathological-cells/triple-negative-breast-cancer/
IHC: http://www.diagnosticpathology.org/content/7/1/60/figure/F3
EGFR

- Developing special interest
- Research
  - Small specimens
  - Cell free DNA
    - Plasma
    - Urine

http://www.uofmmedicalcenter.org/healthlibrary/Article/41261
http://www.karyo.gr/en/equipment/cobas%C2%AE-4800-system
My Experience

- Reciprocal working and learning environment
- Correlation of results
- Maintenance of histology knowledge
- Work in progress
Histology vs Molecular

http://en.wikipedia.org/wiki/Adenocarcinoma
Histology vs Molecular

http://pathology.jhu.edu/department/about/news/news-2010.cfm
Histology vs Molecular
All Together
References