SDSU ACSESS Forum

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Illumina's mission is to develop next-generation tools for the large-scale analysis of genetic variation and function, the results of which will pave the way for personalized medicine.
Higher Manufacturing Efficiency

Driving Higher Throughput per Modular Manufacturing Unit

Drivers
- SNPs per Chip
- Decoding time
- Manufacturing yield

2005 - 2007
21x Improvement in Manufacturing Efficiency and Still Gaining

Mfg Yield × Decoding Speed × Chip Content = Total Throughput
Innovating to Drive Down Costs

SNP Genotyping is a Highly Elastic Market

Whole Genome Association In 2000...

$1/SNP * 550K SNPs = $550K/sample

$550K/sample * 5K samples = $2.75B !!
What skills to grad students lack when they come on board and are essential to develop

- Cross functional and cross-business team experiment
- Understanding of the nature of R&D vs. product development
- How to “Engineer”
- Leadership: technical and project
- Organizational Savvy – how do people get things done in an organization
- Ability to function as part of a high performance team
- Understanding of Manufacturability and Serviceability and role in product success
What skills and/or knowledge should academia include in future curriculum

- Integrated system knowledge – different combinations of:
  - 1980s and 1990s: Electronics, optics, SW, mechanics
  - 2000:to now: Biology, chemistry, molecular biology, bioinformatics, computational analysis, laboratory automation, genetics
  - 2010: All of the above plus manufacturing process development

- Appreciation of how companies work
  - Focus on team results vs. individual results
  - Understanding of the path from idea to product hand-off to operations
  - Understanding of the organizational roles and structure
Hiring at Illumina

Five year outlook
- Hardware engineering, process engineering, chemistry, biology, informatics, software, laboratory automation, computational biology, …

Degrees we look for
- BS, MS, Ph.D.

What else do we look for
- Technology breadth
- Cultural fit
- Ability to function on teams
- Passion for results
- Competence
- Interest in or passion for the “system”