

Advancements in Molecular Genetics

How advancements in clinical information technology has enabled solutions providers in healthcare and laboratory research to achieve ground-breaking results

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Implications of Advancements in Molecular Genetics

- **Current State**
 - Laboratory Information Systems (LIS) have been traditionally designed to facilitate testing processes which are well established and very standardized.
 - Radiology Information Systems (RIS) have been traditionally designed for radiology focused data management, i.e. image retention and retrieval.
- **Future State**
 - Recent revolutionary discoveries in molecular genomics have introduced massive amount of data into laboratory research which is to be managed by information systems.
 - Rapidly changing, FDA and IRB mandated testing protocols has made traditional "hardcoded" testing process supported by traditional LIS systems obsolete.
 - As a software company on the forefront of clinical information systems, SCC has responded to such advancements with solutions designed to address the technological needs of today's medical enterprise.

Implications of Advancements in Molecular Genetics

- SCC has developed new applications for addressing clinical and laboratory needs in:
 - Genomic Databases
 - Translational Medicine
 - Molecular Imaging

Implications of Advancements in Molecular Genetics

- SCC's Genetic Systems Suite (GSS) has provided four essential modules to address the laboratory and clinical needs of today's medical enterprise
 - SoftCytogenetics
 - SoftFlowCytometry
 - SoftMolecular
 - SoftHLA

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- Cyto-genetics- the study of all aspects of cytology, including chromosomal material, using techniques such as fluorescent in-situ hybridization (FISH).
- SCC's SoftCytogenetics streamlines the processing of cases and workflow during research and allows each researcher the capability to conduct user-defined testing protocols for managing data from millions of sample runs in a web-based, enterprise-wide network.

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- FlowCytometry is a technique for counting, examining, and sorting microscopic particles suspended in a stream of fluid.
- SoftFlowCytometry optimizes flow cytometry workflow in the laboratory and allows for further refinement of chromosomal-derived data in molecular genetics.

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- DNA/RNA are the building blocks of each individual's unique genetic composition.
- SoftMolecular enables researchers to create customized workflows for managing research protocols, deriving information from interfacing with automated equipment, and case data attachment for easy access to each patient's entire medical history.

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- Stem cell and tissue repository research involves using breakthroughs from recently developed scientific techniques to assist in medical research for hereditary diseases.
- SoftHLA provides strong database support for derivation of data from customized queries used in transplant reports, serum collection, and patient record management at all levels of the enterprise—from the laboratory to the bed side

Implications of Advancements in Molecular Genetics

- The Genetic System Suite's Interpretative Workstation provides a uniform pipeline of information containing data gathered from all points and accessible through one dashboard for managing results and workflows
- Researchers, clinicians, managers, and senior officers now have access to data vital to each department's decision making functions

Implications of Advancements in Molecular Genetics

- What does it mean for IT solution providers?
 - Revamping traditional LIS and RIS systems to meet the rapid changes in data, process, statistical analysis
 - Allows theoretical goals for organizations involved in translational "personalized" medicine to become a reality
 - Powerful hardware combined with breakthroughs in new software architecture now enable both the researcher and clinician to view and analyze the full potential of molecular genetics in translational medicine

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- What is the net result for doctors and patients ?
 - Physicians are given the freedom to personalize patient disease treatment based on each individual's genetic composition as derived from the laboratory and clinical data
 - Patients are given the freedom to make decisions based on his/her unique genetic history.

Implications of Advancements in Molecular Genetics

- Bringing molecular genetics into the foray of clinical medicine, SCC serves the entire medical community by enabling the Genetic Systems Suite to easily interface with the other SCC modules that are currently being used in translational medicine and medicine in general
- SCC modules such as the Radiology, Pathology, and Blood-banking/biorepository modules readily interface with the Genetic Systems Suite to provide continued and broad access from the "bench to bed-side"

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- The Genetics Systems Suite can be interfaced with the SCC Radiology Information System (RIS) for providing easy access to data that is not readily available in traditional radiological information systems
- Patient's genetic composition can now be correlated to each patient's clinical information

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- For example, a patient's mammogram, MRI, or other vital information can be studied in conjunction with each patient's genetic composition to provide added insight to the clinician in correlating unique genetic components to each patient's unique disease aspects
- Rapid discovery of clinical evidence can now be corroborated with genetic profiles giving doctors faster turnaround times in patient treatment

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- SCC's Genetic System Suite can also interface with SCC's Laboratory Suite (SoftLab, SoftMic, and SoftPath) to allow for real-time correlation between pathology reports and the data derived from an individual's molecular genetic composition
- Autopsy data from deceased patients can now be stored and correlated with genetic information for future genetic research and discovery

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- For cancer or other hereditary research related to derivation of DNA/RNA from tissue samples, SCC's Blood Services Suite (SoftBank II and SoftDonor) enables researchers and clinicians to correlate and analyze data derived from tissue samples obtained from unique populations
- Such information may now be shared with other cancer and genetic research organizations, pharmaceutical companies, and other clinical and non-clinical research groups

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- Specific data derived from biorepository samples can be measured against laboratory and clinical data derived from the use of the Genetics Systems Suite, providing an overlap comparative analysis for researchers to derive their conclusions
- Continual changes and migrations in data patterns are now managed from these different sources through the use of the Interpretative Workstation of the Genetics Systems Suite

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- Currently, SCC has provided its Genetics Systems Suite to approximately six genetic research organizations, including research hospitals, university, and genetic research corporations
- With the dawn of molecular genetics and the plethora of information ready to be discovered using today's cutting-edge informatics applications, SCC has taken the first step into the world of bringing laboratory genetics research and clinical genomics together into one enterprise-wide solution that leverages the knowledge of each expert to find tomorrow's cures

Implications of Advancements in Molecular Genetics

- Future discoveries in the area of molecular genetics will provide ever-increasing insight for researchers and clinicians alike in helping patients deal with their genetically based diseases
- SCC will continue to work with leaders in this new sphere of technology to enable continued success and positive results

QUESTIONS?