The Arrow Project: incorporating research into medical studies

Anat Achiron, MD, PhD
Academic Vice-Dean
Sheba MC, Tel-Hashomer, Israel

June 2014
Arrow project

A targeted young students research program.

Initiated in 2007 in Sheba Medical Center, Tel Hashomer, Israel.

Aims:

• Create young and multidisciplinary research teams; a combination of motivated and exceptional students in their early years of education in medicine, biology, bioinformatics, statistic, physics, psychology and computer science.

• Develop a platform that will strengthen students' knowledge and practice, and train them to be better physicians and researches.
Arrow project: Rational

• Today, with the extreme overflow of information, more and more research questions in the various fields of medicine require deep understanding of various aspects related to the clinics, therapy, epidemiology, imaging, immunology, rehabilitation and quality of symptom management.

• To face this abundance of information, the Arrow Project approach is targeted at building specialized and flexible teams, working together in order to address complicated interdisciplinary research issues.
The designed concept of the Arrow Project is to incorporate students (mainly in medicine) from the second year and forward into clinical and basic research.

Accordingly, students are offered to participate in varying research studies, from the very beginning with formation of an idea or a query, to the presentation of the results in medical conferences and international publications.

Students are paid by a designated grant from Sheba MC, Tel-Hashomer.
**AP Research topics**

- Basic immunologic and molecular genetic research.
- Innovative image analysis techniques mainly related to assessment of MRI using new MRI modalities, advanced software and data mining.
- Clinical aspects of epidemiology, pathology, cancer, infectious and autoimmunity diseases.
Arrow project: The process

• Before being accepted to the Arrow Project, students are evaluated by their learning achievements and personal interests.
• Thereafter, students are tested by various assignments needed for the research, e.g., building a 3-D model of the brain or gene expression data analysis.

• Accepted students spend at least 10 hours/week in the lab, participate in lectures and present their progress once monthly.
• After a 3-month period of knowledge acquisition, a targeted research project is designed for each student according to his/her interests.

• Special emphasis is made to teach and educate students in issues like: Study design, Literature review, and Statistical methods.
• In addition to performing laboratory work, "wetting the hands and mind" from the early steps of research work, students practice lectures, present data in scientific meetings and are taught to write scientific papers.
State of Art

• Currently, 30 students are included in 2014 Arrow Project.
Some samples of APs

- Autosomal recessive multisystem disorder
- Progressive neurodegeneration
- Ocular and cutaneous telangiectasia

Gastric Ghrelin Levels in Children with *Helicobacter pylori*/Gastritis, Infantile Anorexia, FTT and Celiac Disease, Compared with Healthy Children

Talila Lobel, 2nd year Medical Student, Tel Aviv University
Arrow Project

Supervised by:
Dr. Batia Weiss, Pediatric Gastroenterology Unit, The Edmond and Lily Safra Children's Hospital, Sheba Medical Center, Tel Hashomer

Brain Atrophy in Multiple Sclerosis

Chen Shenhar
3rd Y, Medical Student
Tel Aviv University

Research Guides:
Dr. Shmuel Stienlauf
Prof. Eli Swartz

Adult Genetics Clinic
Motivation for genetic evaluation and counseling for adult patients with a focus on Indications for performing molecular tests

Naama Shechter
2nd year Medical Student, Tel Aviv University
Arrow Project
Supervised by Hagith Yonath, MD Genetics and Internal Medicine Sheba Medical Center

Arrow Project

Onn Rozenbaum
4th Year Medical Student
Tel-Aviv University

Aims:
To find correlation between gene expression and brain MRI findings in patients with multiple sclerosis. Prediction of brain MRI progression using gene expression obtained from peripheral blood.

Onn Rozenbaum
4th Year Medical Student
Tel-Aviv University

Brain microstructure changes associated with cognitive performance in MS patients

Avi Abramovitz, 3rd year Medical Student
AP 2014

Bar Rotem
3rd year, 6 year program
Cognition neurotrax

Noa Rozenbord
5th year, 6 year program
Developing an algorithm to predict relapse in Crohn's disease patients

Jonatan Daliot
5th year, 6 year program
A Novel Non Invasive Brain Stimulation Based Treatment for Phantom Limb Pain

Ori Liran
9th year, 6 year program
Nano analysis of exhaled breath for lung cancer early detection

Yossi Tzur
4th year, 4 year program
Cytotoxic Drugs Exposure

Roee Ber
4th year, 6 year program
Normal Bipartity of Fetal PF

Tal Cohen
4th year, 6 year program
Increased Rates of Nocturnal Hypertension in Adolescents with Type 1 Diabetes Mellitus

Lior Orbach
4th year, 6 year program
Quantitative Neuroimaging: Gray and white matter Alteration in Multiple Sclerosis

Shani Dahan
4th year, 6 year program
Genetic Factors Influencing the Phenotype of FMF disease

Wexler Tina
2nd year, NY program
Profiling Metabolic Gene Networks in High and Low

Mizrahi Isaac
2nd year, NY program
Low Dose Dobutamine in Advanced Heart Failure

Stone Evan
Correlation between clinical parameters and UDT metrics in multiple sclerosis patients

Nofar Hezkelo
4th year, 8 year program
Cognition neurotrax

Gadi Miron
6th year, 6 year program
MS Gene Expression Diagnosis

Mohamad Omar Mhajna
6th year, 6 year program
CHROMATIC PUPILLOMETER

Role Holtzman
3rd year, 6 year program
Medullary Thyroid Carcinoma

Omer Segal
3rd year, 6 year program
Risk Factor for Worsened Outcomes of Parkinson's Disease Patients Hospitalized

Nir Livneh
2nd year, 6 year program
MS relapse prediction using serum biomarkers final

Benor Ariel

Dallazadeh Keren

Schwartz Jonathon

Weiss Mia

Aharona Gutman
1 year, 6 year program
Metabolic Modifications and Mitochondrial Activation as a potential

Ronen Shavit
4th year, 6 year program
MRI parameters for prediction of conversion of clinically isolated syndromes to Multiple Sclerosis in children

Carolina Legrada
4th year, 6 year program
MRI for prediction of conversion of clinically isolated syndromes to Multiple Sclerosis in children

Yarden Yavne
3rd year, 6 year program
CT Perfusion

Layah Alkoby
3rd year, 6 year program
Cardiac MRI vs. Echo in STEM

Jonatan Brill
3rd year, 6 year program
Autologous Fat Grafting