The Department of Haematology functions both as a major clinical and laboratory medicine department. It plays a pivotal role in the teaching of haematology to undergraduate medical students (MD), postgraduate students of medicine who have opted to specialise in medicine, and Oman Medical Specialty Board (OMSB) residents in haematology, as well as medical laboratory technicians in the B.Sc. Medical Laboratory Sciences course. Our laboratory provides state of the art haematology testing for the University Hospital (SQUH) and referral services to other private hospitals, as well as highly specialised testing such as flowcytometric and molecular haematological analysis for haematological condition diagnostics for the whole of Oman.
Staff

Faculty
Chao Hung Ho, Professor
Shahina Daar, Associate Professor
David Dennison, Senior Consultant
Anil Pathare, Senior Consultant
Naglaa Fawaz, Senior Consultant
Mohammad Huneini, Consultant
Khalil Al-Farsi, Consultant
Murtadhha Al-Kabori, Consultant
Nadeem Nusrut, Senior Registrar
Zeba Zabeen, Senior Registrar
Hammad Khan, Senior Registrar

Fehmida Zia, Registrar
Fauzia Wasim, Registrar
Abdulmanan Adulgafoor, Registrar
Mehwesh Taj, Registrar
Vinodh Panjwani, Senior House Officer
Najwa Abdulhameed, Senior House Officer
Ghasan Ageed, Senior House Officer
Mohamed Rehan, Senior House Officer
Moez HA Rhim, Senior House Officer

Support Staff
Stuart Donaldson, Superintendent
David Gravell, Chief Biomedical Scientist
Heidi M. Davis, Chief Biomedical Scientist
Shakila Ashraf, Senior Biomedical Scientist
Ali Al-Marhoobi, Senior Biomedical Scientist
Hamood Al-Haddabi, Senior Biomedical Scientist
Rodrigo Villacrusis, Senior Biomedical Scientist
Maria Cicillia, Senior Biomedical Scientist
Abdulrehman N. Rashid, Senior Biomedical Scientist
Qamariya Al-Abri, Biomedical Scientist
Mariyam Al-Brashdi, Biomedical Scientist
Sabah Al-Mahrooqi, Biomedical Scientist
Sahima Al-Mamari, Biomedical Scientist
Saif Al-Hosni, Biomedical Scientist
Hamed Al-Gheithi, Biomedical Scientist
Shoaib Al-Zadjali, Biomedical Scientist
Sumaya Al-Hinani, Biomedical Scientist
Asma A. Musleh, Biomedical Scientist
Karima Al-Falahi, Biomedical Scientist
Badriya Al-Belushi, Biomedical Scientist
Bushra Al-Said, Biomedical Scientist
Mohammed Al-Rawahi, Biomedical Scientist
Muna Al-Maskari, Biomedical Scientist
Ishaq Al-Salmi, Biomedical Scientist
Deuel M. Labrador, Biomedical Scientist
Highlights of the Year 2009-2010

In 2009–2010, the clinical unit treated patients with a vast range of haematological disorders, both as inpatients and outpatients. In addition, the Department runs a thalassaemia day care unit. In 2010, it offered comprehensive care for about 142 patients with transfusion dependent thalassaemia. Of national interest is the successful bone marrow transplant programme, run by this department. By the end of Dec. 2010, a total of 175 allogeneic bone marrow transplants had been performed in this centre, with results as good as those from the best centres around the world.
Teaching Programmes

UNDERGRADUATE PROGRAMME
In this period the Department has: 1) participated in teaching the Haemato-Lymph-Vascular course to the third year students; 2) developed and taught a new module in phase 2 of the undergraduate curriculum on hemato-lymphatic-immunology; 3) participated and coordinated the various courses in phase 2 of the new curriculum, in particular Integrated modules I, II, III; 4) run a 5 week course on case-based learning, in Haematology for the 5th year students in the Integrated Lecture Series (ILS); 5) participated in bedside clinical teaching in Medicine; 6) run Laboratory rotations for 6 groups of 7th year students, each rotation of 5 days duration; 7) run a B.Sc MLS degree course for training undergraduate biomedical scientists.

POSTGRADUATE PROGRAMME
The Department has developed and taught the Haematopathology course along with the Ministry of Health Royal Hospital, which is affiliated with the Oman Medical Specialty Board. There are 6 residents at various stages of training in the programme.

Clinical & Diagnostic Services
The clinical services centre on the following major areas; adult outpatients, adult inpatients; bone marrow transplantation, sickle cell anaemia program; the leukaemia, lymphoma and myeloma programme, and the thalassaemia day care unit. The laboratory services likewise cover specialised areas: haemostasis, flow cytometry, haemoglobinopathy, molecular diagnostics, general laboratory haematology and the blood transfusion service which includes blood donation, storage, irradiation, plasmapheresis and exchange and apheresis facilities as well as the blood grouping and cross matching laboratory.

BONE MARROW TRANSPLANTATION PROGRAMME
The bone marrow transplant programme, established in 1995 in the Department, serves the entire country and continues to provide curative treatment for patients with haematologic malignancy, bone marrow failure and potentially fatal genetic diseases. In 2010, 22 transplants were performed, making a total of 175 transplants since 1995. The results of this transplant centre are comparable with those of the best centres worldwide. Importantly, the cost per transplant is a fraction of what is charged in other countries.

SICKLE CELL PROGRAMME
The Department looks after a large number of patients with sickle cell disease (SCD) providing acute medical care, as well as genetic counselling and preventive programmes (vis-à-vis cord blood testing), and organising and guiding the patients and the medical community in the care of SCD. Recently the role of the Department
has been highlighted through our community outreach programmes via the Hereditary Blood Disorders Society.

**LEUKAEMIA LYMPHOMA AND MYELOMA PROGRAMME**
The Department is now an important tertiary care centre for most referrals for adult haematological malignancies particularly leukaemias, and myeloma. Our patients are able to receive state-of-the-art care both in terms of diagnostic and therapeutic modalities, including bone marrow transplant (BMT) and the advanced molecular diagnostics needed for proper follow-up.

**THALASSAEMIA UNIT**
The Department has been looking after about 150 patients with thalassaemia, delivering comprehensive care including blood transfusions, chelation therapy, and regular meticulous monitoring for the side effects and complications of the disease and its treatment. The unit is a centre of excellence in the region with heavy involvement in care and research including participation in an international drug trial (Exjade). The unit has recently acquired the latest state of art MRI T2* equipment for monitoring the cardiac and liver iron overload status which has improved the monitoring of iron overload in these patients.

**HAEMATOLOGY CLINICS AT THE NEW SOHAR HOSPITAL**
The Department conducts a monthly haematology clinic at the new Sohar Hospital. The clinic is run on rotation basis by one of the Department’s haematology consultants. They are assisted locally by Dr Ali Al-Madhani, from the Department of Medicine, Sohar Hospital.

**GENERAL LABORATORY SERVICES**
The Haematology Laboratory caters to the entire hospital and additionally receives referral samples from all over Oman for routine and advanced haematology laboratory testing. The laboratory is subdivided into various sections including general haematology, haemoglobinopathy, haemostasis and special haematology, blood banking and donor room services, and the molecular division.

**MOLECULAR RESEARCH AND DIAGNOSTIC LABORATORY**
The Department now offers DNA diagnostic facilities for several thrombophilic disorders, haemoglobin disorders, immune deficiency syndromes and malignant haematology, especially for acute and chronic leukaemia. The section is also involved in the monitoring of the transplant progress by chimerism studies in post-transplant patients.
CORD BLOOD BANK
The Department, in collaboration with the Department of Obstetrics & Gynaecology, has now set up a Cord Blood Bank. We have standardised the collection and storage of cord blood samples. Collection of cord blood is currently done under two programs: a) sibling cord blood (SCB) and, b) unrelated cord blood (UCB). Up to August 2010, we had collected a total of 73 SCB units and 41 UCB units. We have so far used 3 SCB units for sibling cord blood transplantation.

APHERESIS UNIT OF THE BLOOD BANK
The Department has now installed the Baxter Amicus and Cobe Spectra apheresis systems and our apheresis nurses and technicians are trained in their use. Both of these systems are now in routine use for harvesting stem cells from donors in the Department’s Bone Marrow Transplantation program and platelet apheresis. Moreover, apheresis services are now made available, in consultation with the attending haematologist on duty, to the SQUH wards and ICU units whenever the need for plasmapheresis or plasma exchange arises.

BUSULPHAN PHARMAKOKINETICS
Optimisation of busulphan dosage in patients undergoing bone marrow transplantation is recommended in order to reduce the toxic effects associated with high drug levels. The API 150 EX LCMS system which has been installed for the research project on intravenous versus oral busulphan in BMT for thalassaemia is now fully operational. The section looks after the busulphan pharmakokinetics in patients undergoing BMT to assess the blood levels of the drug in order to optimise the treatment protocols.

Table 1: Haematology Laboratory Activities

<table>
<thead>
<tr>
<th>Year Jan-Dec</th>
<th>Number of Patients</th>
<th>% increase over last year</th>
<th>Tests &amp; Procedures</th>
<th>% Change on previous year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>11,7631</td>
<td>-12.1%</td>
<td>48,5060</td>
<td>-2.5%</td>
</tr>
<tr>
<td>2008</td>
<td>14,7799</td>
<td>+25.6%</td>
<td>59,8309</td>
<td>+23.3%</td>
</tr>
<tr>
<td>2009</td>
<td>17,7568</td>
<td>+20.1%</td>
<td>71,2520</td>
<td>+19.1%</td>
</tr>
<tr>
<td>2010</td>
<td>19,8109</td>
<td>+11.6%</td>
<td>77,8662</td>
<td>+9.3%</td>
</tr>
</tbody>
</table>
Table 2: Clinical Workload

<table>
<thead>
<tr>
<th>Year Jan-Dec</th>
<th>Haematology Inpatients</th>
<th>% Change on Previous Year</th>
<th>Haematology Day Care</th>
<th>% Change on Previous Year</th>
<th>Haematology Outpatients</th>
<th>% Change on Previous Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>1416</td>
<td>+5.3%</td>
<td>3078</td>
<td>-10.5%</td>
<td>2826</td>
<td>+6.2%</td>
</tr>
<tr>
<td>2008</td>
<td>1409</td>
<td>-0.5%</td>
<td>3035</td>
<td>-1.4%</td>
<td>3428</td>
<td>+21.3%</td>
</tr>
<tr>
<td>2009</td>
<td>1887</td>
<td>+33.9%</td>
<td>3127</td>
<td>+3.0%</td>
<td>4181</td>
<td>+22.0%</td>
</tr>
<tr>
<td>2010</td>
<td>1869</td>
<td>-1.0%</td>
<td>3271</td>
<td>+4.6%</td>
<td>4407</td>
<td>+5.4%</td>
</tr>
</tbody>
</table>

Research

RESEARCH PROJECTS

Establishment of a national facility in stem cell translation research for novel cellular-based therapies and tissue repair


Value: OR 165,000; Project Funder: His Majesty’s Strategic Fund, Oman

Investigators: Dr. David Dennison, Dept. Haematology, SQU; Dr. Sultan Al-Maskari Dept. Surgery, SQU; Dr. Anil Pathare, Dept. Haematology, SQU; Dr. Salam Al-Kindi, Dept. Haematology, SQU; Dr. Khalil Al-Farsi, Dept. Haematology, SQU; Dr. Mohammed Al-Hunieni, Dept. Haematology, SQU; Dr. Nagla Fawaz, Dept. Haematology, SQU; Ms. Qamariya Al-Abri, Dept. Haematology, SQU; Ms. Sahima Al-Maamaari, Dept. Haematology, SQU; Ms. Sabah Al-Mahrooi, Dept. Haematology, SQU; Ali Al-Mahroobi, Dept. Haematology, SQU; Hamed Al-Gheitii, Dept. Haematology, SQU; Shoaib Al-Zadjali, Dept. Haematology, SQU; Melanie Tauro, Dept. Haematology, SQU; Dr. Yasser Wali, Dept. Child Health, SQU; Dr. Abdulhakeem Rawas, Dept. Child Health, SQU; Dr. Muhanna Al-Muslaibi, Dept. Haematology, Royal Hospital, Oman; Dr. Hamoud Al-Dhuli, Dept. Radiology, SQU; Dr. Rashid Al-Sukaiti, Dept. Radiology & Molecular Imaging, SQU; Dr. Shyam Ganguly, Dept. Family Medicine & Public Health, SQU; Dr. Helmut Schuster, Dept. Microbiology & Immunology, SQU; Dr. Adeeb Al-Zoubi, Jordan University, Jordan.
Molecular Genetics of alpha globin gene expression in native Omani Population: Towards understanding the molecular basis of alpha thalassaemia and impact on clinical expression of beta thalassaemia and sickle cell disease

Project Code: RC/MED/HAEM/10/01; Dates: 2010-2012
Value: OR 68,300; Project Funder: The Research Council, Oman
Investigator: Dr. Salam Al-Kindi, Dept. Haematology, SQU; Dr. Muhammed Al-Hunaini, Dept. Haematology, SQU; Dr. Khalil Al-Farsi, Dept. Haematology, SQU; Dr. Anil Pathare, Dept. Haematology, SQU; Dr. Nagla Fawaaz, Dept. Haematology, SQU; Shoaib Al-Zadjali, Dept. Haematology, SQU; Hamood Al-Haddabi, Dept. Haematology, SQU; Dr. R. Krishnamoorthy, INSERM U 763, Paris, France.

Pharmacogenomic factors affecting warfarin dosing: Rationale for prospective genetic screening before anticoagulation therapy

Value: OR 5,400; Project Funder: Sultan Qaboos University
Investigator: Dr. Anil Pathare, Dept. Haematology, SQU; Dr. Salam Al-Kindi, Dept. Haematology, SQU; David Gravell, Dept. Haematology, SQU; Shoaib Al-Zadjali, Dept. Haematology, SQU; Hamood Al-Haddabi, Dept. Haematology, SQU; Dr. R. Krishnamoorthy, INSERM U 763, Paris, France.

Genetic basis of variable expression of fetal hemoglobin in sickle cell disease and beta thalassaemia patients from Oman

Project Code: IG/MED/HAEM/10/01; Dates: 2010–2011
Value: OR 4,700; Project Funder: Sultan Qaboos University
Investigator: Dr. Anil Pathare, Dept. Haematology, SQU; Dr. Salam Al-Kindi, Dept. Haematology, SQU; Mohammed Al-Hunieni, Dept. Haematology, SQU; Dr. Khalil Al-Farsi, Dept. Haematology, SQU; Dr. Shahina Daar, Dept. Haematology, SQU; Shoaib Al-Zadjali, Dept. Haematology, SQU; Sahima Al-Maamari, Dept. Haematology, SQU; Dr. R. Krishnamoorthy, INSERM U 763, Paris, France.

Safety profile and therapeutic use of back ink from Omani fishes in two experimental models of osteoporosis in rats

Project Code: IG/MED/HAEM/10/02; Dates: 2010–2011
Value: OR 11,500; Project Funder: Sultan Qaboos University
Investigators: Dr. Haddia Berehi, Dept. Medical Physics, SQU; Prof. Badreldin Ali, Dept.
Role of von Willebrand factor on the occurrence of vaso-occlusive crisis in patients with sickle cell disease.

<table>
<thead>
<tr>
<th>Project Code:</th>
<th>IG/MED/ HAEM/10/02; Dates: 2010–2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value:</td>
<td>OR 11,500; Project Funder: Sultan Qaboos University</td>
</tr>
<tr>
<td>Investigator:</td>
<td>Mohammed Al-Hunieni, Dept. Haematology, SQU; Dr. Anil Pathare, Dept. Haematology, SQU; Dr. Prof. Ho Chao-Hung, Dept. Haematology, SQU; David Gravell, Dept. Haematology, SQU; Shoaib Al-Zadjali, Dept. Haematology, SQU; Qamariya Al-Abri, Dept. Haematology, SQU; Vinod Panjwani, Dept. Haematology, SQU; Hamed Khan, Dept. Haematology, SQU.</td>
</tr>
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</table>

Prevalence of abnormal bone densitometry findings in individuals with homozygous beta thalassaemia

<table>
<thead>
<tr>
<th>Project Code:</th>
<th>MREC #325; Dates: 2010–11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value:</td>
<td>Unfunded; Project Approval: Sultan Qaboos University</td>
</tr>
<tr>
<td>Investigators:</td>
<td>Dr. Shahina Daar, Dept. Haematology, SQU, Dr. Samir Hussein, Dept. Radiology &amp; Molecular Imaging, SQU, Mohammed Al-Hunieni, Dept. Haematology, SQU.</td>
</tr>
</tbody>
</table>

Prevalence of optimal monitoring of kidney function in relation to patients with thalassaemia.

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<tr>
<td>Value:</td>
<td>Unfunded; Project Approval: Sultan Qaboos University</td>
</tr>
<tr>
<td>Investigators:</td>
<td>Dr. Shahina Daar, Dept. Haematology, SQU; Dr. Sunil Bhandari, Hull York Medical School, UK; Dr. Khalid Al-Rasadi, Dept. Biochemistry, SQU; Humoud Al-Dhuhli, Dept. Radiology &amp; Molecular Imaging, SQU; Surekha Mevada, Dept. Child Health, SQU; Dr Hammad Khan, Dept. Haematology, SQU.</td>
</tr>
</tbody>
</table>

Evaluation of cardiac and liver iron load by MRI T2*

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<tr>
<td>Value:</td>
<td>Unfunded; Project Approval: Sultan Qaboos University</td>
</tr>
<tr>
<td>Investigators:</td>
<td>Dr. Shahina Daar, Dept. Haematology, SQU; Humoud Al-Dhuhli, Dept. Radiology &amp; Molecular Imaging, SQU.</td>
</tr>
</tbody>
</table>
Prevalence of endocrinopathies in thalassaemia major patients, correlation with total body iron load and cardiac iron load

Project Code: MREC #344; Dates: 2010–2011
Value: Unfunded; Project Approval: Sultan Qaboos University
Investigators: Dr. Shahina Daar, Dept. Haematology, SQU; Dr Khalil Al Farsi, Dept. Haematology, SQU; Dr. David Dennison, Dept. Haematology, SQU; Dr Fehmida Zia, Dept. Haematology, SQU; Dr Moez HA Rhim Dept. Haematology, SQU.

Clinical effects of Nicosan TM to reduce the occurrence vasoocclusive crisis patients with sickle cell disease

Project Code: MREC # 352; Dates: 2010
Value: Unfunded; Project Approval: Sultan Qaboos University
Investigators: Dr. Salam Al Kindi, Dept. Haematology, SQU

Retrospective analysis of Sickle cell patient with PORT-A-CATH insertion to analyze complications of PORT-A-CATH in patients with Sickle cell Disease

Project Code: MREC # 357; Dates: 2010
Value: Unfunded; Project Approval: Sultan Qaboos University
Investigators: Dr. Salam Al Kindi, Dept. Haematology, SQU

Evaluation of Cardiac and Liver Iron Load by Cardiac MRI (T2*)

Project Code: MREC # 361; Dates: 2010
Value: Unfunded; Project Approval: Sultan Qaboos University
Investigators: Dr. Shahina Daar, Dept. Haematology, SQU

Causes and Outcome of Fever in patients with Sickle cell Disease

Project Code: MREC # 362; Dates: 2010
Value: Unfunded; Project Approval: Sultan Qaboos University
Investigators: Dr. Khalil Al Farsi, Dept. Haematology, SQU

Acute Chest Syndrome in Sickle Cell Patients during Pregnancy: Risk Factors and Outcome

Project Code: MREC # 363; Dates: 2010
Value: Unfunded; Project Approval: Sultan Qaboos University
Investigators:  Dr. Khalil Al Farsi, Dept. Haematology, SQU.

Causes of Prolonged Prothrombin Time and Activated Partial Thromboplastin Time

Project Code: MREC# 364; Dates: 2010
Value: Unfunded; Project Approval: Sultan Qaboos University
Investigators: Dr. Khalil Al Farsi, Dept. Haematology, SQU.

RESEARCH PUBLICATIONS & BOOKS

Journal Publications


**CONFERENCE & SEMINAR PRESENTATIONS**

**Conference Presentations**

**International**


**Conference Posters**

**International**


National


Seminar Presentations

International

1. Alkindi S. Sickle cell disease program at the Sultan Qaboos University Hospital, 1st Haematology Update Conference. Manama, Bahrain, May 2010.


National


3. Alkindi S. Comprehensive care of patients with Sickle cell disease, Sohar Hospital, Oman, March 2010.

