Application Form for Cancer Genetics Fellowship

Name of Institution: McGill University
Location: Montreal, QC
Number of positions: 1 per year
Length: 2-year

Program Information:

Number of fellowship positions requested
Maximum of one position per year

Academic affiliation
McGill University

Name of hospitals involved in training (% time spent by the fellow in each institution)

- McGill University Health Centre (Montreal Children's Hospital, Royal Victoria Hospital - Cedars Cancer Centre) - 75%
- Jewish General Hospital - 25%

Requirements

- Completed core training program in Pediatric Hematology-Oncology or Adult Oncology.

Background
Worldwide, cancer is a leading cause of death, and the number of cases is expected to rise over the next two decades. Despite the more obvious role of external agents (i.e., carcinogens) in cancer development, it is clear nowadays, that at its very core, cancer is a “genetic disease”, where genetic variants can lead to a transformation and disruption of molecular cellular networks. Understanding the underlying molecular mechanisms to these changes will be vital for the successful implementation of future therapeutic strategies.

Cancer genetics is an emerging field, which sits at the nexus of medical and molecular genetics, oncology, and pathology. Although still young and growing as a medical sub-specialty, its advances have already led to major changes in the way cancer is diagnosed and classified, and have guided the development of novel preventive, surveillance and therapeutic strategies. Moreover, cancer genetics as a discipline has the realistic potential to grow much further in the near future; especially in light of the widespread use of genomic medicine, generating new insights into cancer’s underlying molecular pathophysiology at a hitherto unprecedented rate. It is foreseeable that physician scientists with specialized training in cancer genetics, especially those who are already trained in oncology, will acquire skills and knowledge that will become invaluable for the advancement of research and its translation into patient care. Of note, cancer genetics cuts across both medical genetics and oncology at the service level, so that increasing the numbers of persons with oncogenetics experience in oncology would be of value.

McGill University (MUHC and JGH) is a unique and strategic training centre for a fellowship in Cancer Genetics because:

- It is the only single-centre institution in Canada that houses both Pediatric and Adult Oncology services as well as Cancer Genetics service, as part of the Division of Medical Genetics.
- It is the only provincial centre with a formal cancer predisposition syndrome program dedicated to diagnostics and cancer surveillance.

- It is an accredited training site by the Canadian College of Medical Genetics (biomedical clinical/laboratory, clinical, cytogenetics, and molecular training)
- Access to a clinical molecular laboratory with Canadian and American College of Medical Genetics accredited staff.
- Multiple research programs dedicated to studying the genomic aspects of tumor development (somatic and germline)
- State-of-the-art facilities for the integration of clinical trials in Pediatric and Adult Oncology

By proposing a Cancer Genetics Fellowship at McGill University, we would like to offer medical trainees and clinician-scientists (with a prior Pediatric Hematology-Oncology or Adult Medical Oncology core training) the opportunity to integrate genetic and genomic medicine into their clinical and research activities.

This fellowship is developed in the format of an Area of Focused Competency by the Royal College.

Mission

The goal of the Fellowship in Cancer Genetics is to train individuals who will become fully independent in managing patients with cancer predisposition syndromes, from pediatric age to adulthood. In addition, this Fellowship will provide the clinician with the foundation for an academic career as a clinical researcher in the area of cancer genetics.

Outline

The current Pediatric Hematology-Oncology and Adult Oncology residency training programs do not include mandatory rotations in clinical cancer genetics fields, nor do they include mandatory training in molecular genetics. With the rapid advances in our understanding of the role of genetics in cancer development, a growing gap of knowledge is seen in residents who complete their standard core training in Pediatric or Adult Medical Oncology.

The clinics in cancer genetics, held in the Divisions of Medical Genetics, MUHC and JGH, are designed to provide a practical training for fellows with an interest in inherited susceptibility to cancer. During the course of a 24-month fellowship, the fellow will become familiar with a) cancer risk assessment and b) hereditary cancer management (that is, prevention, diagnosis, and surveillance, as well as cancer treatment strategies). Trainees are expected to become thoroughly familiar with the typical presentations of common cancer predisposition syndromes. Furthermore, they will gain a deeper understanding of counseling issues regarding pre-symptomatic testing. The program structure has some flexibility but will contain several basic and obligatory elements (e.g., outpatient oncology clinics, cytogenetics, and laboratory rotations, etc.). Fellows will split their time between clinical activities (laboratory and patient care activities within the context of cancer genetics) and research. It will be possible to tailor the training to each fellow based on her previous experiences (medical specialty, research experience) and career goals.

Training objectives:

The trainee should complete the following objectives:

1. Evaluation and management of hereditary cancer patients throughout all stages of their cancer journey and genetic diagnosis.

1.1 Evaluate oncology patients for the possibility of an underlying cancer predisposition syndrome

1.2 Become familiar with the clinical manifestations of various cancer predisposition syndromes

1.3 Implement an appropriate diagnostic work-up for patients with a suspected cancer predisposition syndrome

1.4 Manage patients with a cancer predisposition syndrome, from pediatric age to adulthood
- 1.4.1 Become familiar with cancer surveillance strategies and the elements that guide clinicians in their decision making when developing cancer surveillance strategies
- 1.4.2 Participate in familial testing strategies, when appropriate
- 1.4.3 Advocate for personalized medicine treatment strategies, when appropriate

1.5 Understand the ethical and psychosocial challenges related to genetic evaluations in oncology patients

1.6 Communicate effectively with patients during the work-up of a cancer predisposition syndrome and become familiar with genetic counseling strategies

1.7 Provide ongoing monitoring for a patient with a cancer predisposition syndrome during the survivorship stage of the cancer journey

2. Interpretation of clinical diagnostic tests related to cancer genetics

2.1 Understand the elements that factor into the clinician's decision of appropriate genetic tests patients with cancer and/or family members

2.2 Become familiar with the limitations of common genetic tests in patients diagnosed with cancer

2.3 Interpret and communicate genetic results in patients diagnosed with cancer and their families

3. Clinical leadership of the interprofessional team caring for patients with cancer predisposition syndrome

3.1 Facilitate access to, and delivery of, expert medical care for patients with a cancer predisposition syndrome

3.2 Use interprofessional, community, and supportive care resources effectively

3.3 Facilitate the transition of a patient with a cancer predisposition syndrome from pediatric to adult care

4. Advancement of the discipline of cancer genetics

4.1 Develop a scholarly project relevant to cancer genetics

4.2 Educate others about cancer genetics
- 4.2.1 Educate patients on their genetic disease and management plan
- 4.2.2 Educate other health professionals and students about cancer genetics

4.3 Advocate for personalized medicine strategies when appropriate for patients with cancer predisposition syndromes (e.g., clinical trials, enrolment in registries)

Training will involve the following rotations/electives (2-year period)

1. Clinical activities (6-12 months)

Depending on the fellow's previous training, the mandated clinical activities can be focused in adult or pediatric care.

Rotations	Mandated activities	Elective activities
Clinical rotations	• Cancer genetic diagnostics: pediatric and adult (longitudinal over 2 years) • Cancer surveillance clinic: pediatric and adult (longitudinal over 2 years) • Cancer survivorship -long-term follow-up clinic (1 month) • Neuro-oncology: adult or pediatric (1 month) • Solid tumor / sarcoma: adult or pediatric (1 month) • Oncology outpatient clinic: adult or pediatric (1 month)	• Benign hematology: adult or pediatric • Immunology: adult or pediatric • Neurofibromatosis clinic • Genodermatosis clinic • Cancer focused endocrinology: pediatric or adult • Breast clinic • Pancreas cancer - high risk clinic • Genetic counselling - cancer genetics focused
Laboratory rotations	• Molecular genetics: MUHC (2 months) • Cytogenetics: MUHC (2 weeks)	• Molecular genetics: JGH • Molecular pathology: JGH and MUHC

2. Research activities (12-18 months)

Research projects depend on the fellow's interest and prior knowledge and can include any of the clinical or laboratory methodologies available at the MUHC and JGH. Fellows are expected to spend a minimum of 25% and 50% of their time on research-related activities in their first and second year, respectively.

- Research activities can include activities in the "wet lab", such as performing a lab-based patient-oriented research project applicable to cancer genetics, with an emphasis on learning techniques commonly used within a human genetics laboratory, such as PCR, gene sequencing, mutation analysis, western blots, etc. If there is a specific interest in laboratory-based research, the fellow will learn how to derive hypotheses from clinical observations and to design experiments to effectively address them.
- Research activities can include projects in the "dry lab" related to cancer genetics. These projects can involve the study of clinical, bioinformatic, epidemiological, health policy or ethical aspects of cancer genetics.

3. On-Call service

The on-call service will not be an obligatory activity. Participation in the on-call activities will depend on the fellow's future career plans and level of training and expertise. The role of the on-call activities is for the fellow to maintain the level of training and adequate exposure to pediatric or adult oncology, and to remain competitive for staff positions in Hematology-Oncology.

If on-call activities are included in the fellow's curriculum, the trainee will be expected to participate in the day / night on-call activities in Pediatric or Adult Oncology, one weekend per 4-6 weeks, from Friday 5pm to Monday 8am. They will be supervised by a staff pediatric / adult hematologist-oncologist during these on-call periods.

Fellowship Program Co-Directors:

William Foulkes, MBBS PhD: Full Professor in the Depts of Human Genetics, Medicine, Oncology and Obstetrics/Gynecology, with a clinical practice in the Divisions of Medical Genetics, Depts Specialized Medicine at the MUHC and JGH. He is an established clinician-scientist who obtained MBBS in 1984, became MRCP (UK) in 1987 and a PhD in 1994. He has over 600 publications to his name, all focused on various aspects of hereditary cancer susceptibility. He has been a James McGill Professor since 2009 and was elected to the Royal Society of Canada in 2016.

Catherine Goudie, MD: Assistant Professor (Pediatric Hematologist-Oncologist) at the Montreal Children's Hospital and Clinician-Researcher at the RI-MUHC. Following her core training in pediatric hematology-oncology at McGill (2013-2016), Dr. Goudie completed a 2-year fellowship in Cancer Genetics and Solid Tumors at the Hospital for Sick Children in Toronto. She is one of two formally trained pediatric hematologists-oncologists in Canada in the area of the management of young patients with cancer predisposition syndromes. Dr Goudie holds an FRQS-Junior 1 award for her research program dedicated to the diagnosis and management of cancer predisposition syndromes. She also co-manages the cancer genetics clinic at the MUHC (with Dr William Foulkes) and leads the cancer surveillance component of the clinic.

Teaching Faculty:

William Foulkes, MBBS, PhD: Medical Geneticist, Fellowship program co-director

Dr. Foulkes will be responsible, with Dr. Goudie, for the entire fellowship. If the fellow is adult-trained, he will take the lead in terms of responsibilities. Whether adult or pediatric-focused, he will meet with the fellow monthly to assess progress and address issues.

Catherine Goudie, MD: Pediatric Hematologist-Oncologist, Fellowship program co-director

Dr. Goudie will be responsible, with Dr. Foulkes, for the entire fellowship. If the fellow is pediatric-trained, she will take the lead in terms of responsibilities. Whether adult or pediatric-focused, she will meet with the fellow monthly to assess progress and address issues.

Surabhi Rawal, MD MSc: Pediatric Hematologist-Oncologist, Director of the Pediatric Hematology-Oncology Program

Dr. Rawal is a Pediatric Hematologist-Oncologist with a Masters in Medical Education. She will support Drs. Foulkes and Goudie in the development and progress of their teaching curriculum. She is also the Pediatric Hematology-Oncology Program Director and will co-ordinate the involvement of the fellow in the Pediatric Oncology program, and as appropriate, will discuss with the clinical teams how the fellow would be integrated into the call schedule.

Victoria Mandilaras, MD: Oncologist, Director of the Medical Oncology Residency Program

Dr. Mandilaras is a Medical Oncologist with a special interest in the genetics of gynecological malignancies as well as community genetics. She is also the Medical Oncology Program Director and will co-ordinate the involvement of the fellow in the adult Medical Oncology program, and as appropriate, will discuss with the clinical teams how the fellow would be integrated into the call schedule.

Thomas Kitzler, MD PhD: Medical Geneticist

Dr. Kitzler is a Medical Geneticist with a special interest in inherited kidney disease and will offer specialist training in the management of conditions such as Tuberous Sclerosis complex, von Hippel-Lindau disease and Birt-Hogg-Dubé syndrome.

Sharon Abish, MD: Pediatric Hematologist-Oncologist, Long-term follow-up clinic

Dr. Abish is a Pediatric Hematologist-Oncologist with expertise in cancer survivorship. She will offer clinical training in the long-term follow-up of cancer survivors which involves cancer surveillance strategies.

Carolyn Freeman, MD: Radiation Oncologist, MUHC

Dr. Freeman is a Radiation Oncologist with significant expertise in Pediatrics and in the long-term follow-up of cancer survivors. She works alongside Dr. Abish in the survivorship clinic at the MCH and the Cedars Cancer Centre. She is interested in the genetic and treatment related risk factors for the development of subsequent cancers.

Laura Palma, MSc: Genetic Counsellor, MUHC

Laura Palma is an Assistant Professor in the Dept of Human Genetics and a dually certified genetic counsellor with a 15-year experience in Cancer Genetics. She will be in charge of any selected Cancer Genetics Counselling rotations.

Junne Ortenberg, MD: Pediatrician, Director of the Neurofibromatosis Clinic, MUHC

Dr Ortenberg has significant experience in the diagnosis and management of neurofibromatosis, the most common type of cancer predisposition syndrome. She has agreed to support a clinical rotation in the neurofibromatosis clinic and will participate in the education curriculum. She is also interested in neurofibromatosis-related research activities.

Isabelle De Bie, MD PhD: Medical Geneticist, MUHC

Dr De Bie is a medical geneticist and clinical director of the molecular laboratory at the MUHC. She will participate in the education curriculum and facilitate the integration of the fellow in the molecular laboratory. Dr. De bie also has an academic interest in overgrowth syndromes (e.g. Beckwith-Wiedemann, Sotos syndrome) and will provide clinical experience and teaching in this field, as needed.

Chelsea Maedler, MD: Pediatric Pathologist

Dr Maedler is a Pediatric pathologist with expertise in molecular pathology and solid tumors. She will provide clinical training and teaching in the area of somatic changes identified in solid tumors. She is also the Program director of the Anatomical Pathology Residency Program and is a leader in the implementation of the Competence By Design approach of the Royal College in the Pathology training program.

Miriam Blumenkrantz, MD: Pediatric Pathologist, Director of the Cytogenetics laboratory

Dr. Blumenkrantz is the director of the Cytogenetics laboratory and, along with Dr. Lavoie, will provide specialty training and teaching in the approaches for cytogenetic evaluations of solid tumors and blood cancers.

Josée Lavoie, PhD: Cytogeneticist

Dr. Lavoie is a Cytogeneticist with special interest in the somatic changes linked to tumor development and progression. Along with Dr. Blumenkrantz, she will provide specialty training and teaching in the approaches for cytogenetic evaluations of solid tumors, blood cancers and marrow failure disorders.

Andrea Gomez PhD: Molecular Geneticist (Clinical and Research)

Dr Gomez will offer training in somatic molecular genetic analysis of cancers at the MUHC.

Jean-Baptiste Rivière, PhD: Molecular Geneticist (Clinical and Research)

Dr. Riviere is a clinical molecular geneticist with a strong interest and expertise in bioinformatics and clinical research. He will be especially involved if the fellow is interested in bioinformatics, test development or aspects of mosaicism.

Leora Witkowski, PhD: Molecular Geneticist (Clinical and Research)

Dr Witkowski has a PhD from McGill and completed ACMG training at Harvard. She will be implicated in training of the fellow in variant calling, multi-gene panel testing, somatic mutation analysis and will offer research training in laboratory aspects of rare inherited ovarian tumors.

Andrea Ruchon, PhD: Molecular Geneticist (Clinical)

Dr. Ruchon is Director of Molecular Genetics in the MUHC (Optilab) clinical molecular genetics laboratory and will be involved in integrating the fellow into the clinical lab during their molecular lab rotation.

Patricia Tonin, PhD: Molecular Geneticist (Research)

Dr. Tonin is a senior scientist and deputy director of the Cancer Research Program at the MUHC. She will assist with placement of the fellow into RIMUHC research labs. Her research is focused on ovarian cancer.

George Chong, PhD: Molecular Geneticist, JGH (Clinical and Research)

Dr. Chong is an established expert in the interpretation of germline genetic tests relating to breast and colorectal cancer and will offer training in multi-gene panel testing for cancer susceptibility.

Nada Jabado, MD PhD: Pediatric Neuro-Oncologist

Dr. Jabado is a world leader in the molecular genetics of pediatric brain tumors and will offer clinical and research training in all aspects of this field.

David Mitchell, MD: Pediatric Hematologist-Oncologist, Division Director

Dr. Mitchell has extensive experience in pediatric cancer diagnosis and management as well as stem cell transplant. He will offer teaching in the area of stem cell transplant of patients with hereditary cancers or bone marrow failure disorders.

George Zogopoulos, MD PhD: Pancreatic Surgeon and Researcher

Dr Zogopoulos runs the Quebec Pancreas Cancer Study and all aspects of the fellowship that relate to susceptibility to pancreas cancer will be under his direction.

Robert Turcotte, MD: Orthopedic surgeon, MUHC

> Dr. Turcotte is the leading Quebec expert on the management of sarcomas and will offer clinical training and teaching in this area as required.

John Mitchell, MD MSc: Pediatric Endocrinology, MUHC

> Dr. Mitchell is a pediatric endocrinologist with experience in biochemical genetics. He is interested in the diagnosis and management of orphan diseases, some of which are related to cancer development.

Livia Garcia, PhD: Bone and Sarcoma Genomics researcher, MUHC

> Dr. Garcia works closely with Dr. Turcotte, and uses clinical samples from Dr Turcotte for her research. If the fellow is interested in a laboratory project on sarcomas, Dr. Garcia will be able to host the fellow in her laboratory.

The teaching faculty has a broad range of expertise in a number of fields related to pediatric and adult oncology, clinical cancer genetics, laboratory cancer genetics, molecular genetics, cytogenetics, and pathology. The clinical and laboratory faculty collaborate closely with respect to patient care and training of residents and fellows.

Academic Facilities

The fellow will be able to attend weekly held **Grand Rounds** and an **Academic Half-day** in Pediatric Hematology-Oncology, Adult Oncology or Medical Genetics depending on the relevance of the teaching subjects; these can include basic science seminars, clinical case presentations, journal clubs and clinical-oriented resident teaching.

In addition, the fellow will be expected to attend and participate, when appropriate, in the following **clinical / academic rounds**:

- Tumor boards: there are multiple site and population-specific tumor boards held at the MUHC and the JGH
- Molecular tumor boards (weekly)
- Cancer genetics pre-clinic meetings
- Multidisciplinary rounds involving cancer genetic patients
- Relevant journal clubs

The fellows and other trainees have full time electronic access to the McGill University libraries. As well, the Departments of Pediatric / Adult Oncology and Medical Genetics maintain their own small library of books relevant to many aspects of oncology and medical genetics.

Laboratory Facilities:

The MUHC and the JGH offer state-of-the-art molecular and cytogenetic clinical and research platforms with 10 highly trained laboratory personnel with Canadian/American College of Medical Genetics (CCMG/ACMG) accreditation as well as molecular and cytogenetics fellows. The labs perform a multitude of tests, including karyotyping, microarrays, FISH, NGS, qPCR, and Sanger sequencing, and interpret results according to the ACMG guidelines. The staff in the laboratory at the MUHC are closely involved in cancer sequencing studies that are ongoing in pediatric and adult oncology. They also participate in the molecular tumor boards, ensuring proper communication of genetic findings to clinicians in oncology.

Fellow Duties and Responsibilities:

- **Will the fellow be a senior supervisor of residents**: No

- **Are there are fixed rotations at various institutions**: Yes

- **Outpatient clinic**:
  - In their first year, the fellow will participate in 2-3 outpatient clinics per week.
    - The number of patients per outpatient clinic will vary according to the type of clinic: The fellow will be expected to see not less than 3 and not more than 10 new patients per week in their first year.
  - In their second year, the fellow will continue the follow-up of his/her longitudinal clinic patients (cancer genetics diagnostic/surveillance clinic) which will be equivalent to 1 outpatient clinic per week.

- **Outline role of the fellow towards residents on service**: The fellow will contribute to the education (specific to cancer genetics) of the residents. The fellow will also guide residents in the diagnostic work-up and management of patients with suspected/confirmed hereditary cancers. The fellow will also help residents appropriately interpret genetic testing results for their patients.

- **Outline participation in academic activities involving the residents**: The fellow will attend one Academic Half-day and Grand Rounds session per week and will give two structured presentations per year (as part of journal club, resident teaching, etc). The fellow will also attend weekly Tumor boards; as part of participation in these meetings, the fellow will present relevant cases to the rest of the team.

- **Describe any support staff available to the fellow**:
  - The fellow will have support from the Cancer Genetics program co-directors (Drs Foulkes and Goudie), as well as the Medical Oncology/Pediatric Hematology-Oncology program directors and program administrative coordinators throughout the entire fellowship.
  - The fellow will also have access to the members of the Teaching Faculty for guidance (see list above).
  - During outpatient clinics in medical genetics, the fellow will have support from the genetics counselors participating in the clinic.
  - During laboratory rotations, the fellow will have support from the responsible laboratory director and technicians.

- **Proposed meetings to be attended by the fellow**: Attendance at clinical and basic science conferences relevant to the field of cancer genetics (minimum 1 per year). The fellow will also be expected to submit an abstract (minimum 1 during the fellowship).

- **Research productivity and publications expected by the fellow**: It is expected that the fellow will complete one research project (with/without a laboratory component) and that this project leads to a minimum of one publication and a conference meeting.

Curriculum:

- **Intended case load and case variety**:

    - There are over 800 new patient visits to the Cancer Genetics clinic per year (adult and pediatrics combined). There are two main patient groups: 1) children and families that are undergoing cancer genetic investigations; 2) children and adults who have a confirmed cancer predisposition syndrome and who are undergoing cancer surveillance.
    - There is a wide variety of cancer predisposition syndromes that present over the spectrum of ages and that are managed at the MUHC / JGH. These include (but are not limited to): Li-Fraumeni syndrome, breast and ovarian cancer predisposition syndromes, PTEN-hamartoma tumor syndrome, Lynch syndrome, familial adenomatous polyposis, retinoblastoma predisposition, multiple endocrine neoplasia syndromes, von Hippel-Lindau syndrome, overgrowth syndromes, neurocutaneous disorders, etc. There are also a variety of bone marrow failure syndromes and immunodeficiencies that increase cancer risk.
    - The MUHC and JGH manages the full spectrum of pediatric and adult cancers (blood cancers, solid tumors and brain tumors). All components of the care of these patients is available at the MUHC/ JGH (medical oncology, surgery, radiation oncology, short and long-term follow-up of survivors).

- **Schedule of clinical activities**:
    - Outpatient clinics (mandated rotations) are scheduled each week: the current schedule includes:

Weekday	Location	Frequency	Clinic
Mondays	MUHC - RVH	weekly	Adult cancer genetics clinics
Wednesdays	JGH	weekly	Adult cancer genetics clinics
Thursdays	MUHC - MCH	weekly	Pediatric cancer genetics clinics (am)
	MUHC - MCH	weekly	Cancer survivorship clinics (pm)
Fridays	MUHC - RVH (Cedars Cancer Centre)	monthly	Cancer survivorship clinics (pm)

Other clinics (breast cancer, pancreas cancer, neurofibromatosis, neuro-oncology, solid tumor, immunology, adult and pediatric oncology, etc) and clinical laboratory rotations will be held on various days in the week. The fellow's schedule will be carefully made to ensure that clinical and/or laboratory activities are spread through the week.

Finally, the fellow is encouraged to take charge of her own education depending on his/her intended future career duties and style of practice. The specific needs of each fellow will be assessed by the Program co-directors and Teaching Faculty and training will be tailored to best suit each individual fellow's needs.

The assessment of trainees will be done in a multitude of ways:

- In their first year, the fellow will be provided with feedback from physician supervisors at the middle and the completion of each 4-week rotation. The co-directors of the program will collate written evaluation comments from staff who have supervised the fellow throughout their rotations and will provide a written evaluation through One45 (written evaluations will be structured in CanMEDS standardised format). The co-directors will also meet with the fellow to provide feedback every 3 months. As this is a new program, we will also ask the fellow to provide feedback on the structure, academic, clinical, laboratory and research activities within the program. In terms of research, the fellow will be provided with feedback by their research supervisor and program co-directors on a quarterly basis. One formal research evaluation per year will be submitted through One45.

As the second year is predominantly research and longitudinal clinics, the program co-directors and research supervisor will meet with the fellow on a quarterly basis and provide feedback. Two written evaluations will be submitted on One45 (written evaluations will be structured in CanMEDS standardised format).