

University of Dundee

Dundee Discoveries Past and Present

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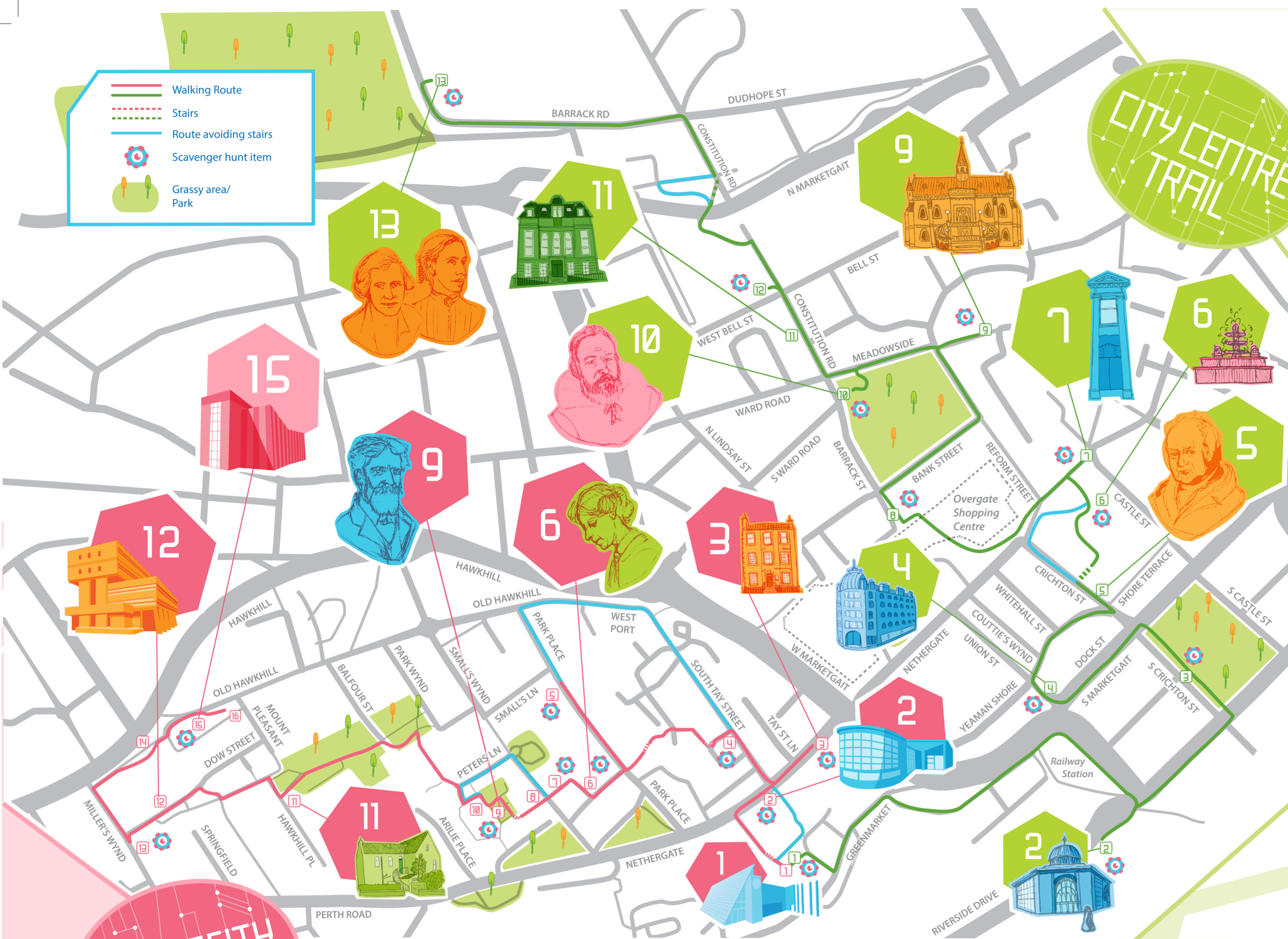
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Start outside Dundee Science Centre

1 Dundee Science Centre

Exploring the past, present and future of medical science, the Medical Marvels exhibition on the first floor of the Science Centre features hi-tech interactive displays and a history of surgery with instruments on loan from the Tayside Medical History Museum.

2 Dundee Contemporary Arts

The DCA stands on the site of Dundee's longest-lasting medieval hospital, known as the Maison Dieu, founded in the 1390s by the Trinitarian Red Friars. After the Reformation it was taken over by the town council and rebuilt. By the 18th century it had fallen out of use and in 1785 the building became a school, the Dundee Academy.

SCAVENGER HUNT – find the plaque on the old wall at the front of DCA!

3 136-140 Nethergate

Nethergate was an important centre for medical practice in Victorian Dundee. At 136 was Dr Thomas MacLagan, whose research into salicin helped pave the way for aspirin. At 138 was the Dundee Eye Institution, which provided free treatment for those unable to afford it. At 140 was Dr David Greig, a noted physician and surgeon who went to the Crimea with Florence Nightingale.

SCAVENGER HUNT – find the decorative flower baskets outside each building!

4 Tay Square

At 4 Tay Square (now replaced with another building) was the practice of Alice Moorhead and Emily Thomson, believed to have been the first all-female medical practice in Scotland. They also helped to establish Dundee Women's Hospital on Seafield Road.

SCAVENGER HUNT – find the Dundee Women's Trail plaque!

5 Dundee Dental Hospital & School

The Dental Hospital was first founded in 1914 in a flat in 4 Park Place thanks to members of the Dundee Dental Club, who wanted to provide a free service to those most in need. It expanded into larger premises next door at number 2 in 1916 when the Dental School also opened. Extensions were added in 1950 and 1968, when the massive tower block opened.

Today, the School of Dentistry is one of the top in the UK, educating and training the next generation of dental health professionals and serving the public by providing high quality dental care. Their innovative research focuses on developing new materials, guidelines, policies and technologies, for example the development of 3D imaging technologies designed to improve and personalise future orthodontic treatment.

SCAVENGER HUNT – can you find the 1950 date above one of the doors?

6 Carnelley Building

The Carnelley Chemistry Laboratory was the first building to be purpose-built for University College, Dundee (now the University of Dundee), opening in 1883. Life Sciences teaching now takes place in the building, which is also home to the D'Arcy Thompson Zoology Museum. D'Arcy Thompson was the University's first Professor of Biology and a pioneer of mathematical biology. His successor as head of the Natural History department was Doris Mackinnon, an expert on parasitic micro-organisms. She later became Professor of Zoology at Kings College, London – one of the UK's first women professors.

Today, research into parasites continues at the School of Life Sciences. Parasites are responsible for diseases such as malaria and visceral leishmaniasis. Susan Wylie and her team from the Wellcome Centre for Anti-Infectives Research are looking for compounds that can stop the parasites and help understand how they work.

SCAVENGER HUNT – can you find Peter Randall-Page's sculpture *In the Beginning* at the western entrance of the building? It was inspired by cells multiplying!

7 Old Medical School

Dundee began to establish a Medical School in 1888 and a Faculty of Medicine was formally established when University College became part of the University of St Andrews in 1897. This building opened in 1904 and was the main home of the Medical School for over 60 years. Today the School is based at Ninewells Hospital.

SCAVENGER HUNT – can you spot a carving of St Andrew on the front of the building?

8 Fleming Building

Originally built as the University College gymnasium, this building is now one of the homes of the Leverhulme Research Centre for Forensic Science. Activities in the laboratory here include the development of cutting edge technology for the detection of forensic samples and understanding the

transfer and persistence of DNA and other trace evidence such as fibres and glass.

9 Geddes Quadangle

This area is named after Patrick Geddes, who was the first Professor of Botany at University College, Dundee. He laid out these and other gardens on campus for teaching use. Geddes had wide-ranging interests and applied ideas from biology to many other fields, including town planning and sociology. Today, many courses use the University's Botanic Garden for teaching.

SCAVENGER HUNT – find the sundial! It was designed in 1914 by the Professor of Physics William Peddie.

10 Carnegie Building

The Carnegie Building was built in 1909 as a Physics laboratory. It was in here that ground-breaking work was done from the 1950s to the 1980s on the molecular structure of crystals (a process called X-Ray Crystallography). This technology continues to have important uses for Dundee researchers in DNA, cancer, virus and drug discovery research.

11 Hawkhill House

This 18th-century house is the oldest building on campus. For over 40 years it was home to the Botany department (now the Plant Sciences division of the School of Life Sciences) and still houses the University Herbarium (comprising many thousands of plant specimens) as part of the Museum Collections.

12 Medical Sciences Institute

The MSI Building opened in 1970 as part of a major expansion of the newly independent University of Dundee. It housed Anatomy and the rapidly growing Biochemistry department. These subjects have now developed into the world-leading Centre for Anatomy & Human Identification (CAHID) and School of Life Sciences.

Start outside Dundee Science Centre

1 Art & Science Orchard

This mini-orchard is one of 25 planted by the Dundee Urban Orchard initiative in 2013-17. Made in collaboration with Dundee Science Centre and Dundee Contemporary Arts, its layout was inspired by the Fibonacci sequence, a numerical pattern which appears frequently in both art and nature.

SCAVENGER HUNT – find Isaac Newton's Tree!

2 Discovery Point

The British National Antarctic Expedition on board RRS Discovery included important biological research by Edward Wilson and Thomas Vere Hodgson. The extreme conditions faced by the crew meant that the ship's surgeon, Reginald Koettlitz, played a vital role. On board the ship you can see a recreation of the original sick bay.

SCAVENGER HUNT – find the penguin sculptures!

3 Discovery Walk, Slessor Gardens

The plaques at Discovery Walk (designed by artist Suzanne Scott, aka Whimsical Lush) celebrate notable pioneers of discovery and exploration in Dundee. We'll meet many of the names featured here elsewhere on the tour, but for now we'll focus on Geoffrey Dutton, whose revolutionary work on how the infant body deals with toxic chemicals helped to save the lives of many babies. He was one of the key people who helped to establish Dundee as a leading centre for biomedical sciences.

More recently, pharmacologist Ola Epemolu (from Kevin Read's lab in the Drug Discovery Unit at the School of Life Sciences) worked on understanding how the body deals with a new drug so that it has the desired effect without causing unwanted side effects. The DDU have been instrumental in successfully developing a single dose treatment for malaria and two different drugs for visceral leishmaniasis, all now in clinical trials.

SCAVENGER HUNT – find Dutton's plaque!

4 Malmaison Hotel

Near this site was Dundee's Cholera Hospital, an isolated tenement building converted in 1826. This was a time when epidemic diseases were common, and the hospital was well-used when cholera struck Dundee in 1832. 808 cases were reported, 505 of whom died.

Today, Cryptosporidium (a microscopic parasite that causes diarrhoea in young children) is studied by Mattie Pawlowicz in the School of Life Sciences. Mattie and her lab are trying to understand how the parasite is spread from person to person.

SCAVENGER HUNT – find the carved head above the hotel entrance! We think it might be the Duke of Connaught (Queen Victoria's third son) who visited Dundee in 1899 to unveil his mum's statue!

5 Crichton Street

Crichton Street is named after the family of John Crichton, one of the original attending surgeons at Dundee Infirmary when it opened in 1798. He worked there for 57 years and was renowned for his skill at removing stones from the bladder – his mortality rate of less than 7% was remarkable in the days before effective anaesthesia and antiseptics.

6 City Square

St Clement's Court (demolished to make way for City Square) was home to the Dundee Rational Institution. Founded in 1809, this was Dundee's first major scientific body, whose members met regularly for scientific research and debate.

SCAVENGER HUNT – find the marker on the ground to St Clement's Church (clue – start in the northern corner)

Today CAHID studies the human body using their 'silent teachers' - Thiel-embalmed cadavers. The knowledge gained from their research can help doctors, dentists, anatomists, forensic anthropologists and others to understand the human body better.

Allotments on the site of the Biological Sciences Institute

Biology teaching was also greatly expanded after 1967 and the BSI Building was constructed here to complement the MSI. Teaching now takes place in the Carnelley Building and Old Medical School, and the BSI was recently demolished and replaced with allotments for students and staff.

SCAVENGER HUNT – Find the Edible Garden mural nearby!

14 Medicinal Garden

This area is where the WeeCAIR Medicinal Garden is currently being developed by the Wellcome Centre for Anti-Infectives Research and the University Botanic Garden. Many medicines used today come from the active ingredients of plants that would have been used in traditional herbal remedies. Once complete, the garden will help uncover the history of medicine as well as how plants today are still being researched to help create new medicines.

15 Discovery Centre

The latest addition to the School of Life Sciences was opened in 2014. The building provides additional space for the expanding School with dedicated laboratories for drug discovery, proteomics and computational biology.

SCAVENGER HUNT – Find the large sculptural panels on the side of the building – they feature an artwork called *Scales of Life* by Elaine Shemilt.

7 Campbell's Close, 76 High Street

Campbell's Close was home to the Dundee Phrenological Society. Founded in 1824, it was Dundee's first medical society. Phrenology involved studying the bumps on people's heads to predict their personality and mental traits. Hugely popular in its day, it was largely discredited by the 1840s.

Today, research into the brain takes place at the University of Dundee. Matthew Taylor, a PhD student in Dario Alessi's lab in the MRC Protein Phosphorylation & Ubiquitylation Unit, investigates the mechanisms that underpin Parkinson's disease, which may help to uncover new therapeutic targets for the disease.

SCAVENGER HUNT – find the decorative gate at the entrance to the close!

8 William Gardiner Square

This garden area is named after botanist and poet William Gardiner, but should perhaps be named instead after his uncle Douglas Gardiner, who created a botanic garden near this site. William became the first person to create a systematic catalogue of local plant life, *The Flora of Forfarshire* (1848).

Today, Barley is a major global cereal and the number 1 crop in Scotland. Sarah McKim at the School of Life Sciences studies how barley grows and develops to find routes toward sustainable increases in barley grain yield and quality.

SCAVENGER HUNT – find the ladybird on the mural!

9 The McManus: Dundee's Art Gallery & Museum

The McManus was founded in 1867 as the Albert Institute of Literature, Science & Art. Its main hall opened just in time to host the first Dundee meeting of the British Association for the Advancement of Science, which proved a crucial stimulus to scientific development in the town. Today, the Making of Modern Dundee gallery on the ground floor includes a display on Medicine & Biotechnology.

SCAVENGER HUNT – find the carved heads of Queen Victoria and Prince Albert above the original entrance to the building!

10 The Howff

One of the many notable figures buried in the Howff is David Kinloch, a Dundee doctor who became physician to King James VI. While on royal business in Toledo he was imprisoned by the Spanish Inquisition from 1588-94. In 1596 he published the first account of obstetric practice in Scotland.

SCAVENGER HUNT – find Kinloch's tomb (clue – it's in the north-west corner, in front of the wall monument to Alexander Riddoch)

11 10 Constitution Road

This building was originally the Watt Institution, Dundee's first attempt at higher education. Although the building dates from 1838, the Watt Institution was originally founded in 1824. It initially concentrated on teaching maths, chemistry and mechanics, but lack of enrolments led to it covering more popular topics such as natural history (taught by William Gardiner). It eventually closed in 1849.

12 Abertay University

Founded as Dundee Technical Institute in 1888, Abertay University has been responsible for many innovations, including Scotland's first science-based nursing degree (started in 1975) and a pioneering Continuous Passive Motion machine for patients recovering from joint injury, designed by David Carus in 1990. Abertay also became renowned as Scotland's leading centre for cryopreservation research, and in 2004 scientists here became the first in the world to breed a golden eagle using frozen sperm.

SCAVENGER HUNT – can you spot the Abertay University crest? (you may find more than one!)

13 Dundee Royal Infirmary

Opened in 1855 (replacing an earlier Infirmary from 1798), Dundee Royal Infirmary was the city's main hospital until the opening of Ninewells in 1974. Much ground-breaking work was done here – for example, in the 1870s Rebecca Strong transformed nursing conditions and training; in the 1920s Margaret Fairlie used radium to treat gynaecological cancer patients; and in the 1950s James F Riley revolutionised our understanding of allergies with his work on the mast cell. The hospital closed in 1998 and is now flats.

Today, Henry McSorley's group in the School of Life Sciences investigates how parasitic worms could be the key to treating allergic conditions such as asthma, identifying molecules released by parasitic worms and using these to interfere with allergy-causing immune cells, such as mast cells.

SCAVENGER HUNT – find the plaques to Margaret Fairlie and Rebecca Strong (clue – you'll need to look away from the hospital!)

16 Sir James Black Centre

This building (opened in 2007) is named after the Nobel Prize-winning pharmacologist James Black, who studied in Dundee and later became the University's Chancellor. He is best known for developing drugs to treat heart disease and stomach ulcers.

The building hosts the world-renowned Drug Discovery Unit, leaders in developing new treatments for infectious diseases found in Africa, Asia and Latin America – malaria, TB, visceral leishmaniasis and Chagas disease. They also specialise in drug discovery for diseases with a global impact such as Alzheimer's, Parkinson's, cancer and COVID-19.

DUNDEE DISCOVERIES

Past & Present

Dundee is now celebrated internationally for its pioneering work in medical sciences, in particular the University of Dundee's ground-breaking research into cancer, diabetes, drug development and surgical techniques. But the city has many more amazing stories of innovation and discovery in medicine and biology, past and present, and the three walking tours presented here will introduce you to some of the most extraordinary.

Basic information about each topic is presented on this map, but you will find more in-depth information, images and videos on the accompanying website at uod.ac.uk/DundeeDiscoveriesMap

For younger explorers, we have also included a Scavenger Hunt – look out for the cancer cell symbols on the map and see if you can find the various features listed along the way!

Please share your experience using #DundeeDiscoveries

Safety notice
Please follow current Scottish Government COVID-19 guidance while undertaking this activity.

Start at Mariner Drive car park

1 W L Gore & Associates

Gore is a US-based company. Their famous Gore-Tex fabric is used here to make vascular grafts for the surgical repair of diseased and damaged blood vessels.

Cardiovascular research is a large focus at the University of Dundee's School of Medicine. For example, Chim Lang's research group is interested in the mechanisms underlying cardiac complications of diabetes. This better understanding can help develop new blood tests and drugs to help combat an important public health problem.

2 Maggie's Dundee

Designed by internationally renowned architect Frank Gehry, Maggie's Dundee opened in 2003 as a centre for cancer support. Dundee's long history of specialist cancer care goes back to 1906 with the opening of the Caird Cancer Hospital at Dundee Royal Infirmary.

SCAVENGER HUNT – Find the statue by Antony Gormley (famous for The Angel of the North). It's the tenth in a series of 100 sculptures around the UK called Another Time. ○

3 Ninewells Community Garden

This volunteer-run community garden uses horticulture to support wellbeing, therapy and rehabilitation. Eight of the beds are laid out as a physic garden, featuring plants traditionally used in medicine. The surrounding woodland (known as Ninewells Arboretum) was once part of the estate of nearby Invergowrie House and contains trees over 250 years old!

SCAVENGER HUNT – find the mosaic and look for a rabbit in a wheelbarrow! ○

4 George Pirie Way

This road is named after Dundee's x-ray pioneer Dr George Pirie. Within months of their discovery in 1895, Pirie was experimenting at Dundee Royal Infirmary on the clinical possibilities of x-rays. Sadly he was unaware of the dangers involved, and lost both his hands and one eye due to radiation damage.

5 Patrick Blair Place

Blair was a Dundee physician who established an early natural history society and a botanic garden in Dundee. However he is best known as the first person to dissect an elephant in 1706 – the animal was being toured as an attraction and died somewhere on Broughty Ferry Road.

6 James Arrott Drive

Arrott was a leading physician at Dundee Royal Infirmary in the early 19th century and a prime mover in the development of the new infirmary building which opened in 1855 (featured on the City Centre tour).

SCAVENGER HUNT – spot the street sign with his name on it ○

7 Pharmaceutical Specials Service

This new facility manufactures medicines when available licensed medicines don't meet the specific needs of patients. These include medicines for patients who have swallowing difficulties or intolerance to particular ingredients, and specialist ointments and creams for dermatology patients.

8 Jacqui Wood Cancer Centre

Jacqui Wood was Chair of the Ninewells Cancer Campaign from its foundation in 1991 until her own death from the disease in 2011. She worked tirelessly to raise millions of pounds for cancer research, and this building was named in her honour.

Today, the laboratory of Colin Henderson and Roland Wolf studies how medicines are broken down in the body. The aim is to improve anti-cancer therapy and how it is delivered to patients.

9 Clinical Research Centre

Opened in 2007, the Clinical Research Centre is a hub for clinical trial activity, focusing on key research areas such as cancer and cardiovascular disease. The centre has also become renowned internationally for its work in diabetes research, conducting large-scale population studies and using this data to deliver better health outcomes.

For example, SHARE (Scottish Health Research Register) aids medical research by helping find the right people for the right health research projects. The SHARE Biobank provides leftover blood samples for anonymised medical research.

10 TORT Centre

TORT stands for Tayside Orthopaedic and Rehabilitation Technology. It began life in 1965 as the pioneering Dundee Limb Fitting Centre in Broughty Ferry, which provided an integrated rehabilitation programme for amputees. The centre has since expanded to encompass the latest prosthetics and other forms of assistive technology.

11 Thomas MacLagan Way

Dr Thomas MacLagan was Medical Superintendent at Dundee Royal Infirmary in the 1860s, where he pioneered the clinical use of thermometers. His most important work, however, was the research he carried out into the anti-rheumatic effects of salicin, a chemical extracted from willow bark. MacLagan's work was taken up by German researchers who used salicin to develop acetyl-salicylic acid - better known today as aspirin.

Understanding how medicines work and how to make them better is one area of research that takes place in the School of Medicine. Postdoctoral researcher Nicola Morrice from Calum Sutherland's lab is trying to improve the way that the drug Metformin is used in the treatment of people with type 2 diabetes.

12 Ninewells Library, School of Medicine

Dundee's Medical School has developed significantly from its first beginnings in 1888, and was recently named top Medical School in the UK in the Complete University Guide 2021.

SCAVENGER HUNT – spot the stained glass windows, designed by Janice Aitken. They were inspired by eukaryotic cells (a fundamental building block of the human body) and look best at night with the light shining through them. ○

13 Main Entrance, Ninewells Hospital

Ninewells was the first new teaching hospital to be built in Britain since the 19th century, and many of its design principles were revolutionary. When it opened in 1974 it attracted attention from all over the world, and was hailed by the International Hospital Federation as the "Jewel in the Scottish Hospital Crown". Many important innovations have taken place here since then, including the birth of Scotland's first IVF ('test tube') baby in 1984.

Innovation in fertility continues here with the Reproductive Medicine Research Group, led by Dr Sarah Martins da Silva, researching male infertility and male contraceptive development. Male infertility accounts for around 50% of cases and is poorly understood, while men still have no option for contraceptives.

SCAVENGER HUNT – look for more stained glass in the covered entrance! The windows here were made by Britta Sugden and feature Dundee's Nine Incorporated Trades and Three United Trades. Can you count them all? ○

14 Kirsty Semple Way

Kirsty Semple ran a GP practice in Dundee from 1951-1981. She set up Tayside Breast Care and Mastectomy Group in 1978, and also helped to set up Tayside Council on Addictions. One of her GP patients was cartoonist Dudley D Watkins, who is said to have dressed Daphne Broom in her outfits!

Today, Andrew Evans and colleagues in the School of Medicine use new breast imaging procedures to help diagnose breast cancer and to predict its behaviour.

15 Mackenzie Building

This building is home to the Centre for Medical Education, which has played a pioneering role in developing medical teaching around the world. One of its early successes was the Objective Structured Clinical Examination (OSCE), developed in the mid-1970s as a reliable objective method of measuring clinical skills – it is now used worldwide.

Jane Dickson, based in the Mackenzie Building, works in the Antibiotic Research in Care Homes team who investigate how staff manage infections, communicate with prescribers and ensure good care for their residents. ARCH are working to solve the puzzle of how to reduce safely and improve antibiotic use in care homes.

16 Radiotherapy department

The Radiotherapy department opened at Ninewells in 1975, building on the earlier work of pioneers we have already encountered such as George Pirie and Margaret Fairlie. It has always boasted state-of-the-art equipment, including Dundee's first linear accelerator (1975) and CT scanner (1986).

SCAVENGER HUNT – Look through the window on the corner to find a beautiful glass installation by artist Paula Thomson ○

17 Carseview Centre

Mental health treatment began in Dundee in 1805 when an asylum opened as part of the Infirmary. A separate Lunatic Asylum opened off Albert Street in 1820, moving to larger buildings at West Green in 1882. It was renamed Royal Dundee Liff Hospital in 1963, but replaced in 2001 with this smaller facility, reflecting the shift towards out-patient care.

Today, Carseview Centre and NHS Tayside play a pivotal role partnering with the University of Dundee to help shape the psychiatrists and mental health nurses of the future by providing shadowing opportunities and practice placements in a variety of mental health care settings.

18 Wilson House

The building at the end of Wurzburg Loan is home to the Institute for Medical Science & Technology, which brings together experts in biomedical and physical sciences. Among its innovations are the development of new minimal-access surgical instruments, which Dundee is world-famous for pioneering thanks to the vision of Sir Alfred Cuschieri, who came here as Professor of Surgery in 1976.



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