Queen's University of Belfast
- Flexibility and User Involvement at the Centre for Cancer Research and Cell Biology

The Building and its Users

The Centre for Cancer Research and Cell Biology (CCRCB) building was built in 2007, with 4800 m^2 of floor space, at a cost of £9.2 million (£1916 per m^2). It houses multidisciplinary research teams from biological sciences, chemistry, maths, pharmacy and physics. A key activity is tissue culture.

The building is located on the main Queen's Health Science campus, near to other medical/science labs and the Belfast City Hospital. The design was constrained by the site (an awkward wedge-shape, with no road access) and the proximity of residential buildings. The solution is a strikingly shaped five-storey building with a full height glass atrium. This separates narrow plan, naturally ventilated, office and write-up space (photo left) from a deeper plan, mechanically ventilated, "Wet Block". This has the main labs around the perimeter for views and daylight, and secondary support labs in core areas. Daylighting is increased by glazed screens on internal office walls, and windows to secondary labs. These also provide more **s**timulating views out, and views into the working areas. The basement contains additional support facilities, and a lecture room, and there is a rooftop plant room.

The building floor space is close to Wellcome Foundation benchmarks, with 37% primary, 18% secondary, 15% tertiary and 30% balance. There are 13 Variable Air Volume (VAV) fume cupboards on the chemistry floor. There is also a Containment Level 3 lab, whose supply air is drawn from the main laboratory, with all extract through safety cabinet fans and filters. This avoids any possibility of positive pressure and avoids the need for a separate ventilation supply and extract system, with consequent savings in capital and running costs.

Other energy efficiency features include thick flat slab floors providing high thermal mass (and good vibration resistance); high efficiency condensing gas fired domestic hot water heating linked to solar water heating; heat recovery on all full fresh air ventilation plant; variable speed drives on all pumps and fans; zoning of all air and heating systems and a chilled water circuit. In addition the building provides much of its toilet flush requirements from rainwater.

A trapezium form and dividing atrium creates a distinctive building with high use of natural light and ventilation.

Key Points

- The atrium fosters research interaction by channelling circulation and providing good internal visibility
- Flexibility is enhanced by modular layouts and careful planning of services
- Zero defects on handover and a rigorous pharmaceutical industry approach to commissioning
- An experienced lab manager co-ordinated user requirements and provided a single point of contact
- The lab is very popular with staff, and has helped funding success and recruitment
- The building energy performance is below target at 256 kWh/m^2 of electricity and 244 kWh/m^2 of gas
- Many low carbon features including solar water heating and ventilation heat recovery

S-Lab Case 1 – QUB's Centre for Cancer Research

Innovations and Points of Interest

Lab management – Patricia White, CCRCB, until recently, Chief Technician and Building Liaison Officer, both managed technical support within the lab (where each floor has a dedicated technician), and provided a central point of contact re laboratory operational issues for academics, estates and suppliers. Her work has been recognised by an MBE.

User involvement – Patricia, University Estates Personnel, academics and others were closely involved with all stages of the design process. This included an outline Briefing at RIBA Stage C to identify all the accommodation and relationships; and a detail briefing at RIBA Stage D to identify the specific requirements and optimum lay outs for every area. There was also a post occupancy debriefing session.

Commissioning – this was not allowed to start until the building was dust-free and more time was allowed than normal. A zero defects target was set (and achieved on handover). The process used a pharmaceutical industry approach of Installation Qualification (IQ) and Operational Qualification (OQ) check systems/paperwork

Flexibility – reconfiguration is made easier by a generic modular layout of laboratory and office space on each floor; repetitive modular floor plans (including specialist secondary laboratories); location of lifts, stairs and vertical ducts on the building periphery; and installation of spare flues within extract funnels. Disruption from services maintenance or modification has also been minimised by access to vertical ducts from circulation spaces outwith the labs, and containment of all horizontal services within each floor. The flexibility has already made change easier, including additional fume cupboards installed on the top (chemistry) floor.

Whole life costing – this was used in conjunction with dynamic modelling to compare a number of passive solutions and renewable/low carbon technologies. All those adopted had paybacks under seven years, even at 2005 energy prices.

Science unites Ian Paisley and Martin McGuinness.

Views

"Our lab is efficient and successful because we chose Design and Construction teams with proven relevant experience; worked together to ensure early strategic agreement and good project management; and had good internal involvement and co-ordination, resulting in quick decisions."
Gary Jebb, Estates Director

"I like the central staircase and the glass roof, and the brightness that brings in. The labs are well laid out with the student room beside it and the freezer rooms etc. off the main walkway."

"The big multigroup lab is good for interaction, as are the coffee areas in each floor. Everything is nice and bright which ... creates a nice environment to work in."

Researcher survey comments

Further Information – www.goodcampus.org (presentations are in the Events section)
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