Science and research

make

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Big Data Institute Gateway Building Old Road Campus Research Building Oxford Molecular Pathology Institute NDM Research Building Kennedy Institute of Rheumatology **Innovation Building** Foreword

The past decade has seen significant evolution in the way scientific research is conducted. Collaboration has become the watchword – and not just between close colleagues, but between departments and disciplines, academia and industry, start-ups and the FTSE 100. It's created a wonderful cross-fertilisation of ideas that will only be accelerated by data analysis and machine learning – the next frontier of change. At Make, we understand the kind of world-class facilities this research requires. Since 2007 we've

delivered seven laboratory buildings: six for the University of Oxford and one for the University of Nottingham. Each facility unites cutting-edge laboratory spaces with the best of today's commercial workplace, with researchers working together on critical projects like the Oxford-AstraZeneca COVID-19 vaccine.

Though unique in their form, material and function, our buildings share features that create welcoming, dynamic environments. These include diverse activity-based spaces, physical and visual connectivity, natural light, healthy materials, and a strong social heart. Our designs are flexible, sustainable and efficient, built to actively support the research that's reshaping our world.

Ken Shuttleworth

Founding Director, Make Architects

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Make Architects



Make is a different kind of architecture practice. Founded by Ken Shuttleworth in 2004, we're an employee-owned firm pursuing a democratic design process that values everyone's input. Today we have more than 150 Makers in London, Hong Kong and Sydney providing architecture, interior and urban design services from concept to completion. Our science and research portfolio dates back to 2005 and includes laboratory buildings dedicated to biomedical, life, plant and data science research across three different campuses for the University of Oxford and the University of Nottingham. We design each scheme to respond to its environment, reflect the associated institution's reputation and goals, and provide an inspiring environment for users, whether they're researchers, academics, students or staff.

We've worked with these world-leading institutions to create spaces that advance groundbreaking research and underpin new partnerships. These hubs feature top-quality spaces for wet and dry labs, write-up spaces, meeting rooms, breakout areas, and social amenity spaces. Their considered design helps drive forward investment and research that makes a difference in people's lives.

Big Data Institute

CLIENT University of Oxford

BUILT 2017

CONTRACTOR Mace

DESIGN TEAM Architect: Make Project manager: CPC Building services: Long and Partners, RES Structural engineer: Peter Brett Associates Cost consultant: Arcadis

The RIBA Award-winning Big Data Institute is a medical research building dedicated to complex analytical research into the causes, consequences, prevention and treatment of disease. This includes projects like the Recovery trial to find an effective COVID-19 treatment and the UK Biobank programme. Together with the Target Discovery Institute in the NDM Research Building next door, also by Make, it forms the Li Ka Shing Centre for Health and Information Discovery.





1 Diagrams showing the evolution of the building form. The U-shaped footprint provides a clear front and back, with a central atrium that offers strategic views through to the working areas surrounding it.

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2 Diagram of the underground labyrinth, a fundamental part of the environmental strategy. The BDI is the first UK research building to use a labyrinth beneath the building for cooling, and achieved a BREEAM 'Outstanding' score of 86.5%. 3 The subterranean labyrinth under construction. The mechanism draws in air through the atrium lightwell and uses the thermal mass of the ground to cool it before circulating it to the main rooftop plant room. This air is then distributed via floor plenums and extracted via the atrium using the stack effect.







4 Masterplan model showing the Big Data Institute and the Innovation Building in the wider context of the Old Road Campus. The BDI's tapered prows allow views to and from the adjacent buildings on the campus, create a sense of arrival, and provide much-needed new amenity space on the campus.













5 Lower ground floor plan as built. This space incorporates two seminar rooms with clerestory windows, and a servery with a lightwell and rooflight that provide a glimpse of the new public realm outside.

6 Ground floor plan as built. Each floor has a mix of perimeter cellular offices and generous open-plan spaces interspersed with social and breakout areas for different methods of collaboration and working.

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7 Approach from the main road, with formal landscaping. The facade draws on the horizontal cladding of the neighbouring NDM Research Building, with a veil of grey polyester powder-coated aluminium bands and glazing.



8 South-east approach, where the articulation of the building form has enabled the inclusion of several informal planting areas.



- 9 Typical research spaces with a mix of open-plan working areas and cellular offices. A major component of the brief was providing visual connectivity and fostering personal interaction across the building's workspaces.
- 10 (Opposite) Atrium with natural light, feature stair and acoustic timber lining. The feature stair offers visual connectivity, aids circulation and animates the building across all four levels.



11 Main equipment room as seen from the atrium. The opaque white glass wall reveals shadows as people pass behind it.



12 Glimpse of the main equipment room with servers. The BDI processes and stores significant amounts of data on a daily basis, with its server room providing enough computing power for 600 trillion computations per second.





13 View of open-plan working spaces with cellular offices above. The atrium has acoustic timber lining to reduce noise transfer within the open-plan arrangement.

14 View of the servery from the atrium, with internal pedestrian bridges above linking different wings of the building.



15 Lively breakout spaces in use. The building features three different types of breakout space: lively, quiet and silent.

- 16 (Below) Open-plan offices with clear sightlines across the floor.
- 17 (Right) Quiet breakout space in use. The diverse blend of workspaces allows people to meet and interact in different environments.
- 18 (Below right) Silent breakout space on level 1.









19 Informal landscaped area to the north-east, with seating and planting.



20 Approach from south-east. The main roof plan has been located to the west to minimise impact on the campus 'street' and adjacent Old Road.



²¹ Julian Wild's 'Origin' sculpture at the north-east approach. The stainless steel artwork is the largest public sculpture in Oxford and is inspired by the groundbreaking research undertaken on the Old Road Campus.

Gateway Building

CLIENT University of Nottingham

BUILT 2011

CONTRACTOR Herbert Baggaley Construction

DESIGN TEAM Architect: Make Project manager: Sand Project Management Building services: Couch Perry Wilkes Structural engineer: Price & Myers Cost consultant: Sand Project Management

The Gateway Building, on the University of Nottingham's Sutton Bonington campus, serves both the School of Biosciences and the School of Veterinary and Medical Science with a mix of labs, plant growth rooms, teaching spaces, offices and study areas. The project is part of a 20-year masterplan to expand the campus and enhance the university's reputation as a leader in plant and animal sciences.





1 Sketch showing the building's termination at a new boulevard and the treeline that flanks the building,







2 Competition visuals showing the building as an arrival point on the tree-lined boulevard.















3 Models exploring our innovative straw-bale facade concept, which uses straw in an external curtain wall system. We fitted the straw into timber frames finished with render for a natural look to the external face.



4 The flying factory where the timber panels were prefabricated, using local labour and straw from the university's own farmland – a show of local, sustainable production.





5 Straw panels constructed on site. Our environmentally friendly design was informed by Sutton Bonington's strong agricultural heritage and sustainability track record.







6 Construction images showing the straw panels being installed on site. Each panel spans all four floors of the building in one prefabricated piece.







7 (Opposite) Internal views of the central circulation route and facade. We maximised this multi-purpose interior with an 80% efficient floorplate.











9 North elevation and level A plan.

- Key 1 Main entrance 7 Lab lobby8 Lab
- 2 Atrium 3 Office
- 4 Meeting room 5 Plant/services
- 9 Temperature-controlled growth room
- 6 Computer room

8 Site plan.





10 (Opposite) The completed gateway, which offers visitors a distinct sense of arrival.



11 Internal view of the new atrium with feature staircase. This arrival space was not part of the initial brief, but it has created a much-needed space for students to gather and meet before classes.

12 View of the exposed straw via truth windows that reveal it to passers-by.



13 Entrance atrium and gateway upon completion.





14 Lab spaces in use.

Old Road Campus Research Building

CLIENT University of Oxford

BUILT 2007

CONTRACTOR Mace

DESIGN TEAM Architect: Make Project manager: RB Development Building services: Foreman Roberts, Long and Partners Structural engineer: Price & Myers Laboratory consultant: Nightingale Associates Cost consultant: Arcadis

The Old Road Campus Research Building – Make's first for Oxford – houses six departments from the medical sciences and engineering divisions. United for the first time in one building, the departments specialise in vaccines, oncology, structural genomics, clinical pharmacology and biomedical engineering. One of the departments, the Jenner Institute, developed the Oxford-AstraZeneca COVID-19 vaccine in 2020 and was at the forefront of Ebola vaccine trials in 2014.







1 (Clockwise from top left) Diagrams exploring the building's sun path, atria, relationship with surrounding trees, and flexibility of use.

2 Cross-section showing one atrium, the café, and front and rear entrances. The building is three storeys above ground, with a partial basement that accommodates a slope across the site.











- 3 (Top) Diagrams showing different workspaces across the building. The structural grid accommodates flexible office spaces that can contract or expand over time depending on the needs of different departments.
- 4 (Bottom) Diagrams showing the typical conditions of the facade and the relationship with desks and research spaces.



5 Stair and atrium study models. The building's facilities are set around two naturally lit atria that form the social heart of the 4-storey structure, offering a contemporary reinterpretation of a traditional university quad.

- 50
- Old Road Campus Research Building





Cladding studies











7 Concept sketches showing the high-performance cladding system with louvres, cores and cladding. Glass and aluminium panels wrap the building, with external louvres protecting against solar gain.

- 52 Old Road Campus Research Building
- 6 Cladding studies. The distinctive spectrum of greens visually harmonises with the mature planting surrounding the site and creates a pixel effect that breaks down the scale of the building.



Key

1	Entrance	6	Write-up space/
2	Reception		offices

7 Breakout space

8 Rear entrance

9 Plant

- 2 Reception
- 3 Atrium
- 4 Café
- 5 Laboratory



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1	Entrance	6	Write-up space/	
2	Reception		offices	
3	Atrium	7	Breakout space	
4	Café	8	Rear entrance	

- 5 Laboratory
- 9 Plant



10 East elevation.



11 Cross-section.







12 Atrium staircase with cast in-situ concrete. The building's social heart includes a café and a knowledge centre.



13 Feature staircase in use. The atria offer direct visual connections into the labs, allowing a glimpse of research in process.



14 Lab spaces in use. The building's highly efficient plant reduces the energy consumption of this high-tech research building.





Oxford Molecular Pathology Institute

CLIENT University of Oxford

BUILT 2011

CONTRACTOR Mace

DESIGN TEAM Architect: Make Project manager: RB Development Building services: Long and Partners Structural engineer: Peter Brett Associates Laboratory consultant: Nightingale Associates Cost consultant: Arcadis

Located on the university's South Parks Road Science Campus, the Oxford Molecular Pathology Institute is part of the Sir William Dunn School of Pathology. The facility holds some 200 scientists researching diverse and overlapping areas such as stem cells, infection and immunity, and RNA and gene expression. The OMPI is one of three interconnected buildings that accommodate the school.













2 Location plan showing the Oxford Molecular Pathology Institute. The building has been designed to strengthen links with the institute's sister departments by functionally integrating shared resources.

1 Diagrams exploring the building's adjoining relationship with the Sir William Dunn School of Pathology next door.





Provide links between new and existing buildings.



Service from the existing EPA Building.



Replace the Leslie Martin Building.





4 Sections showing the top-lit atrium and open-feature staircase. Flexible laboratory spaces surround the stairs, which create a focal point where people can meet and interact.

66 Oxford Molecular Pathology Institute

Expand social and amenity spaces.

3 Diagrams indicating the strategy for replacing the former block on the site and connecting the new building to its neighbours.



5 Cladding study showing the horizontal louvres on the facade, which take their inspiration from cell structures.



6 North elevation.



7 Cladding elevation patterns inspired by the DNA ladder. The louvres provide solar shading on the building's southern facade.



- Key 1 Main entrance 2 Existing café

7 Breakout space8 Air lock

9 Primary laboratory10 Secondary laboratory11 Plant

- 3 Café terrace
- 4 Main staircase
- 5 Office6 Meeting room











- 10 Images showing the relationship between the Oxford Molecular Pathology Institute and the Dunn School. The new building picks up the fine detailing, colour and texture of the adjoining one, carrying them through with stone and terracotta cladding.
- 11 (Opposite) Cladding detail. The louvres' appearance changes depending on their angle and the direction of sunlight.











13 View of the top-lit atrium and staircase. The stair is lined with timber, a nod to the original building on site and to Oxford's academic heritage.

12 Cladding details at the building entrance, including louvres at different scales. Varying rotations of the louvres cast shadows, giving a layered effect to the facade.



14 Looking down at the breakout spaces at the base of the atrium, designed to encourage chance meetings between building users.



15 Laboratories in use.



NDM Research Building

CLIENT University of Oxford

BUILT 2013

CONTRACTOR Mace

DESIGN TEAM Architect: Make Project manager: RB Development Building services: Long and Partners Structural engineer: Peter Brett Associates Laboratory consultant: Nightingale Associates Cost consultant: Arcadis

This multi-disciplinary medical research building houses clinical researchers specialising in areas from tropical medicine and cancer to viral immunology and respiratory medicine. It's also home to the world-leading Target Discovery Institute, which investigates drug target discovery. Together, the TDI and Big Data Institute next door form the Li Ka Shing Centre for Health Information and Discovery.







1 Concept sketch of the building, which features a tapering prow and horizontal slot windows. It sits adjacent to two other medical research facilities designed by Make.





3 Section showing the extent of timber cladding in the atrium and staircase. The interior spaces have been crafted to create an intimate scale and establish a sense of ownership among the research groups that inhabit it.

2 Diagrams of circulation showing visual and physical connections between different workspaces. The aim was to establish a sense of connectivity that would improve collaboration and communication among occupants.



- Key
- 1 Anodised aluminium louvre
- 2 Clear glazing3 Light shelf
- 4 Spandrel panel
- 5 Precast concrete

Typical facade bay D

Key 1 Entrance

2 Atrium

3 Office

- 7 Waste laboratory
- 8 Kitchenette
- 9 Store
- 10 Autoclave and
- atory glass wash
- 4 Write-up space5 Primary laboratory6 Secondary laboratory



4 North elevation.



5 South elevation.





- 7 South elevation showing the horizontal louvres cladding the building. The slot windows and rooflights project varying patterns of natural light into the building's interior, creating energising contrasts of sunlight, shadow and shade.
- 8 (Opposite) Front entrance expressing the timber-clad atrium from the outside. The building's full height is immediately revealed on entry, creating a welcoming and legible internal arrangement. NB: The paving has since been reconfigured as part of the Big Data Institute's external landscaping.







9 View looking up to the top of the atrium. A prominent sawtooth configuration on the underside of the staircase follows the lines of treads and risers above.

11 (Opposite) Cantilevered timber staircase connecting the upper floors to the café in the basement. This elm-clad feature stair winds up through the 4-storey atrium, unifying the floors both physically and visually.



10 View down through the atrium. A stainless steel handrail wraps around the internal faces of the stair to provide a visual contrast with the warm texture of the elm.

13 Secondary lab with clerestory windows to prevent overlooking.



14 Lab equipment in use.





12 Primary lab with adjacent write-up space. The aim was to create a direct visual connection between these areas, helping facilitate building users' collaboration and research.

Kennedy Institute of Rheumatology

CLIENT University of Oxford

BUILT 2013

CONTRACTOR Mace

DESIGN TEAM Architect: Make Project manager: RB Development Building services: Long and Partners Structural engineer: Peter Brett Associates Laboratory consultant: Nightingale Associates Cost consultant: Arcadis

In 2011 the Kennedy Institute of Rheumatology, an international centre for research into inflammatory and degenerative diseases, relocated from London to join the University of Oxford. Make's bespoke home for the institute is a state-of-the-art laboratory, training facility and teaching hub all in one. The lab follows a 'bench-to-bedside' philosophy in which research is directly used to develop new ways of treating patients, with researchers working alongside clinicians.







2 Concept sketch of the interior spaces. The collaborative, cross-disciplinary nature of the institute's work prompted us to design a bright interior that establishes a strong sense of openness and community.





4 Section showing atrium circulation. A welcoming space at the front of the ground floor functions as a relaxing staff breakout area.





7 South elevation.



8 CGI glimpse into level 2. The organisation of the lab benches allows for views from the full-height glazing.







Key

1 Entrance

- 2 Atrium
- 3 Café
- 4 Kitchen
- 5 Office
- 6 Lecture theatre
- 7 Seminar/boardroom

9 Autoclave and

glass wash 10 Store

14 Plant

Write-up space
Primary laboratory
Secondary laboratory

8 Deliveries



9 Ground floor plan as built.

5m



11 East elevation showing the café space at the lower level, with offices above that feature outward-opening windows.



12 Main entrance with canopy in use.



13 View of the staircase at the main entrance from various angles. The glazed atrium and feature staircase act as a primary circulation hub rising from the ground floor, with a roof lantern drawing natural light into the heart of the building as well as the write-up spaces on levels 1 and 2.



14 (Opposite) First floor views through to the staircase and fabric acoustic wall behind. Thin white fritted stripes emphasise the verticality of the space, while the zig-zagging staircase – formed from steel, terrazzo and glazed balustrades – conveys a crisp sense of precision.







- 15 Ground floor café in use. The building's interiors were chosen to offer views of both interior and external surroundings, maximising visual permeability and transparency.
- 16 (Opposite) Glass cladding detail. The panels create alternating reflective and matte strips that play on the reflections in the green cladding of the nearby Old Road Campus Research Building.



Innovation Building

CLIENT University of Oxford

BUILT 2018

CONTRACTOR Mace

DESIGN TEAM Architect: Make Project manager: CPC Building services: Hoare Lea Structural engineer: Peter Brett Associates Cost consultant: Arcadis

The Innovation Building, Make's sixth for the university, is home to commercial research laboratories and a start-up workspace known as the BioEscalator. Located at the Old Road Campus entrance, the building serves to enable collaboration between the commercial researchers it houses and the academic researchers across the rest of the campus. It also provides a centralised car park for the estate and a distribution centre for campus-wide deliveries.





1 Diagrams indicating The Cut, which separates the medical research spaces from the car park. The building is designed to streamline distributions across the campus, reduce traffic and deliver new biomedical start-up workspace. 2 Stage C composition explosion. The BioEscalator floors deliver high-tech research facilities for start-up enterprises, with the additional two floors of laboratory space.





3 Original competition models showing the west elevation and facade concept. The building is unified with an external design inspired by the trees found around the site.



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4 (A–D) Frit design iterations. The lab portion of the building uses four different details of the maple leaf screenprinted onto opaque back-painted unitised cladding. On the car park, aluminium fins twist to imitate a view through the trees.

D





Key 1 Entrance

2 Atrium 3 Reception

- 8 Laboratory9 Write-up space10 Store11 WCs
- 4 Meeting rooms
- 5 Tea point 6 Start-up studio 7 Office
- 12 Car park13 Distribution centre14 Plant











9 Kitchen





9 Short section.





8 North elevation.

7 West elevation.









12 Main entrance/exit to the multi-storey car park. A digital script was used to define specific twists in the aluminium blades to give the appearance of tree silhouettes across the facade.



13 Main entrance with projecting fin that separates the building's different functions.

14 View inside The Cut. The 5-storey atrium features European Oak acoustic timber cladding and a full-height stair that links the functions and provides vertical access.



15 View of the level 3 bridge in The Cut.



16 (Above and right) Looking up into the top-lit atrium in The Cut.



17 (Opposite) View showing the contrast between the leaf pattern cladding of the research spaces and the twisted blades of the car park.



BOOK TEAM

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