About the revolution in ‘digital’:

‘Digital’ is powering something of a revolution in university education. Everyone wants high quality video (not just recordings of live lectures and seminars). Students want it, not as a substitute for ‘contact hours’ but in addition to them. However, high quality video is expensive to produce in both time and money. Clearly there is a challenge here for universities as they seek ways to meet expectations in a cost-effective manner. Access to The Biomedical & Life Sciences Collection provides a solution as it spreads the cost among many institutions worldwide.

Introduction:

The Biomedical & Life Sciences Collection contains over 2,500 specially commissioned lectures, presented by world leading experts, including Nobel, Lasker and Breakthrough prize winners.

In addition to meeting the needs of researchers, the lectures support blended, distance, team and flipped classroom programmes and self-motivated learning. Topics covered range from basic science to therapeutic intervention, from the level of the single molecule to entire populations. The complete collection is available at https://hstalks.com/biosci/

To date, twelve Nobel Laureates have contributed lectures to the collection:

1. Prof. James Allison - “Checkpoint blockade in cancer immunotherapy”
2. Prof. Bruce Beutler - “Innate immune sensing and response”
3. Prof. Sir Martin Evans - “Mouse Embryonic Stem Cells”
4. Prof. Edmond Fischer - “Phosphorylase and the origin of reversible protein phosphorylation”
5. Prof. Joachim Frank - “Structural insights into aminoacyl-tRNA delivery by EF-Tu and translocation by EF-G”
6. Prof. Jeffrey C. Hall - “Cracking the case of circadian rhythms by Drosophila genetics”
8. Prof. Roger Kornberg - “Chromatin and Transcription”
9. Prof. Venkatraman Ramakrishnan - “Structural insights into decoding of mRNA by the ribosome”
10. Prof. Ralph Steinman - “Dendritic cells: linking innate to different forms of adaptive immunity”
11. Prof. Thomas Steitz - “The structural basis for how the large ribosomal subunit catalyses peptide bond formation”
12. Prof. Sir Gregory Winter - “Antibodies by protein engineering”

Please see Appendix 1 for a listing of further examples of lectures
How HSTalks is used in academia:

The HSTalks collections are not a substitute for what academic teaching staff organize and deliver but rather a resource to be used to enhance the learning experience. The collection’s range and variety supports, complements, extends and enriches education.

All talks or any extract from a talk is easily integrated and embedded within your Virtual Learning Environment and all the slides can be printed to support note taking. The collection supports blended, distance, team and flipped classroom programmes and self-motivated learning.

Below are some of the most common ways in which the collection is used regularly by programme directors, teaching staff, graduate students, postdocs and undergraduate students in academic institutions:

- Embedding in Online Learning Systems as part of courses, in preparation for a class or as additional learning material following lectures.

- In blended, distance, team learning and flipped classroom programmes (where students access lectures at home and then attend the university for discussions, workshops, tutorials, seminars and supervised exercises).

- Material for small-group and individual-student courses which a university could not otherwise provide.

- To fill gaps in departmental expertise. No single institution can retain the number and range of leading experts represented in the collection.

- Ensuring that researchers, teachers and students have access to a wide range of expert knowledge both in their own and other fields.

- Effectively acquiring knowledge when starting a new project, and developing a deeper understanding of the context within which an ongoing project is being undertaken.

- Reducing the need to travel to and attend international conferences and preparing for such conferences when attendance is appropriate. Students, in particular, have difficulty in attending international conferences that would enable them to listen to talks by a wide range of world-leading authorities.

- To pursue self-motivated enquiry. Remember: with talks in the collection, world leading experts can be made to repeat any part of their talk as many times as required until the attendee feels they have gained a full understanding.
Appendix 1: Examples of lectures

Biochemistry

Designing proteins with life sustaining activities
Prof. Michael Hecht – Princeton University, USA

Fuzzy protein theory for disordered proteins
Prof. Monika Fuxreiter – University of Debrecen, Hungary

Perspectives on biological catalysis
Prof. Stephen Benkovic – The Pennsylvania State University, USA

Amyloid fibrils as functional nanomaterials
Prof. Juliet Gerrard – University of Auckland, New Zealand

Mitochondrial production of reactive oxygen species
Prof. Martin Brand – Buck Institute, USA
**Genetics & Epigenetics**

**Heterochromatin, epigenetics and gene expression**
Prof. Joel C. Eissenberg – Saint Louis University, USA

**The Silent Revolution: an Introduction to Gene Regulation by microRNAs**
Dr. Frank Slack – Director of the iRM, Harvard Medical School, USA

**Structure, evolution and dynamics of gene regulatory networks**
Dr. M. Madan Babu – MRC Laboratory of Molecular Biology, UK

**The molecular mechanism of X chromosome inactivation**
Prof. Neil Brockdorff – University of Oxford, UK

**Gene-drives and active genetics: introduction to gene-drives and their implications for health and society**
Prof. Ethan Bier – University of California, San Diego, USA
**Microbiology**

**Gram+ bacterial microbiota - Yin & Yang of infectious disease**
Prof. P. Patrick Cleary – University of Minnesota, USA

**An Introduction to Retroviruses: Replication Strategy and Genetics**
Dr. Jonathan Stoye – Francis Crick Institute, UK

**Introduction to microbiota: agents for health and disease**
Prof. B. Brett Finlay – University of British Columbia, Canada

**How bacterial pathogens avoid phagocyte killing**
Dr. Thomas Areschoug – Lund University, Sweden

**National and international surveillance of antibiotic resistance**
Prof. David Livermore – Public Health England’s Antibiotic Resistance Monitoring and Reference Laboratory, UK
Cell Biology

The ERK1/2 MAPK cascade
Prof. Melanie H. Cobb – University of Texas Southwestern Medical Center at Dallas, USA

Traffic problems: inherited disease and intracellular trafficking defect
Dr. Paul Gissen – University College London, UK

Quality control of proteins mislocalized to the cytosol
Dr. Ramanujan Hegde – MRC Laboratory of Molecular Biology, UK

DNA damage, mutations and aging 1
Prof. Jan Vijg – Albert Einstein College of Medicine, USA

The Myc transcription factor network
Prof. Robert N. Eisenman – Fred Hutchinson Cancer Research Center, USA
**Immunology**

**Priming of T cell responses**
Prof. Victor Appay – INSERM, France
Dr. Francesco Nicoli – Universities of Ferrara and Padua, Italy

**Immunosuppressive mechanisms in myeloid cells**
Prof. Dmitry Gabrilovich – University of Pennsylvania, USA

**The classical pathway of complement**
Prof. Mohamed R. Daha – Leiden University Medical Center, Netherlands

**Regulation of the immune response to pathogens**
Prof. Anne O’Garra – National Institute for Medical Research, London, UK

**Future directions for vaccine discovery**
Dr. Chris Wilson – Bill and Melinda Gates Foundation, USA
Neuroscience

Alzheimer's disease: where are we up to?
Prof. John Hardy – Institute of Neurology, University College London, UK

AMPA-receptors and fast synaptic transmission in the brain
Prof. Stuart Cull-Candy – University College London, UK

Protein degradation and defense against neurodegenerative disease
Part 1 of 2
Prof. Alfred Goldberg – Harvard Medical School, USA

Parkinson’s at 200 years: an update on Parkinson’s research in 2017
Prof. Patrick A. Lewis – University of Reading, UK

The clinical features of amyotrophic lateral sclerosis: diagnosis, natural history and epidemiology
Prof. Kevin Talbot – University of Oxford, UK
Omics & Systems Biology

**Systems biology of the cell cycle**
Prof. Bela Novak – University of Oxford, UK

**A systems approach to implementation of personalized cancer therapy**
Prof. Gordon B. Mills – MD Anderson Cancer Center, USA

**Interactome networks and human disease**
Prof. Marc Vidal – Harvard Medical School, USA

**Comparing transcriptomes of distant organisms: the comparative ENCODE resource**
Prof. Mark Gerstein – Yale University, USA

**Impact of systems biology on metabolic engineering**
Prof. Jens Nielsen – Chalmers University of Technology, Sweden
Cancer

Genetics of tumor metastasis
Prof. Robert Weinberg – Whitehead Institute for Biomedical Research, USA

Immune checkpoint blockade in melanoma
Dr. Elizabeth Buchbinder – Harvard Medical School, USA

Chromosome translocations and cancer
Prof. Felix Mitelman – Lund University, Sweden

Functional cancer genomics
Prof. Roderick Beijersbergen – Netherlands Cancer Institute, The Netherlands

Pharmacogenomics in cancer therapy
Prof. Sharon Marsh – University of Alberta, Canada
**Pharmaceutical Sciences**

**Rules and filters and their impact on success in chemical biology and drug discovery**
Dr. Christopher Lipinski – Melior Discovery Inc., USA

**Structure-based drug design**
Dr. Nathan Brown – Institute of Cancer Research, UK

**Pulmonary drug delivery**
Prof. Anthony J. Hickey – RTI International, USA

**Fragment-based lead discovery**
Dr. Daniel A. Erlanson – Carmot Therapeutics, Inc., USA

**An introduction to randomization for clinical trials 1**
Prof. William Rosenberger – George Mason University, USA
**Clinical Medicine**

**Type 2 diabetes**
Prof. Edward Boyko – University of Washington, USA

**Coagulation in sepsis**
Prof. Marcel Levi – University of Amsterdam, Netherlands

**Systemic lupus erythematosus: diagnosis and management**
Dr. Sara K. Tedeschi – Harvard Medical School, USA

**Post-resuscitation syndrome after cardiac arrest - Protecting the Brain**
Prof. David Seder – Tufts University School of Medicine, USA

**Assessment of renal function**
Dr. Jochen Raimann – Renal Research Institute, USA
**Diseases, Disorders, & Treatments**

**Inflammatory bowel disease**
Prof. Ole Haagen Nielsen – University of Copenhagen, Denmark

**CLL: novel prognostics, and updates on therapy**
Prof. Jennifer R. Brown – Harvard Medical School, USA

**NASH: Update on diagnostics and therapy**
Dr. Arun J. Sanyal – Virginia Commonwealth University, School of Medicine, USA

**Renal complications of sickle cell disease**
Dr. Claire Sharpe – King’s College London, UK

**Psoriasis**
Prof. Chris Griffiths – University of Manchester, UK
Metabolism & Nutrition

Obesity management: lifestyle and bariatric surgery
Prof. John Wilding – University of Liverpool, UK

Dysregulated eating behaviour, eating disorders and obesity
Prof. Ulrike Schmidt – King’s College London

Metabolic communication in development and control of obesity
Prof. Elaine Holmes – Imperial College London, UK

Obesity pharmacotherapy: options and uses in clinical practice
Prof. Scott Kahan – Johns Hopkins University Bloomberg School of Public Health, USA

Paneth cells, antimicrobial peptides and the regulation of the intestinal microbiota
Dr. Nita Salzman – Medical College of Wisconsin, USA
Reproduction & Development

Setting the second stage: the evolution of menopause & post-reproductive life
Prof. Lynnette Sievert – University of Massachusetts Amherst, USA

Evolutionary Obstetrics
Prof. Wenda Trevathan – New Mexico State University, USA

Left-Right Asymmetry in Embryonic Development: How epigenetic, biophysical forces and gene activity interplay to determine a major embryonic axis
Prof. Michael Levin – Biology Department, TCRDB, Tufts University, USA

Barrier mechanisms in the developing brain: protection or vulnerability?
Prof. Norman Saunders – University of Melbourne, Australia

Application of proteomics in fetal and neonatal medicine
Dr. Joost P. Schanstra – INSERM, Toulouse, France
Agriculture & Environmental Sciences

Agricultural genetics for food security
Prof. Robert Henry – University of Queensland, Australia

Why is the world green? Top-down and bottom-up controls on ecosystems
Prof. Jonathan Shurin – University of California-San Diego, USA

Animal behavioural genetics
Prof. Temple Grandin – Colorado State University, USA

Macroecology
Dr. Natalie Cooper – Natural History Museum, London, UK

Epigenetics in agriculture
Prof. Graham King – Southern Cross University, Australia
Methods

Modern production of laboratory animals
Dr. Martin Toft – Adlast, DK

Statistical techniques in human population genetics
Dr. Garrett Hellenthal – University College London, UK

An introduction to randomization for clinical trials 1
Prof. William Rosenberger – George Mason University, USA

An introduction to statistics for statistical genetics: models and techniques common in statistical genetics
Dr. Paul O'Reilly – King’s College London, UK

Legal and ethical issues in uses of stored tissue in human subjects research
Ms. Gail Javitt – Johns Hopkins University, USA