



The Workers Union Ensemble perform Hearing HIV. The ensemble initially came together in 2008 whilst studying at the Guildhall School of Music and Drama. They have gradually evolved into a seven-piece line-up of oboe, saxophone, piano, double bass, two percussionists and conductor.

# THE VIRUS WITHIN: HEARING HIV

Imagine an audible representation of the journey of a virus through a human cell, hearing through a piece of music the processes and passages it takes and the intricate biological reactions involved.

That is exactly what Dr Ben Oliver, Head of Music at the University of Southampton and Dr Chad Swanson, Lecturer in the Department of Infectious Diseases, School of Immunology & Microbial Sciences at Kings College London (KCL) have created.

Ben has always had a keen interest in linking science and music. A lecturer here at Southampton since 2011 and Head of Music since the summer of 2019, one of his first arts-science collaborations was the Arts and Humanities Research Council-funded 'Compositions for Cochlear Implants (CI)' project which explored aspects of music that

can be appreciated by CI users. Through the creative process of composition and the development of new software, researchers worked with CI users to gain a better understanding of specific music styles and structures that were readily appreciated and enjoyed through a CI.

'Hearing HIV' was first conceived when Chad attended a concert featuring one of Ben's compositions, *Zeros & Ones*, in which several musical signals and triggers were used that provided clear reference points for the listener. For example, the piano has a musical gesture in the opening part of the piece that 'turns

on' musical layers and a high note cluster that 'turns off' musical layers. Dr Swanson saw a real connection between these musical techniques and cellular processes.

As soon as they started collaborating, the two realised they had the potential to fulfil a dual purpose. At the core was the aim to facilitate through music the understanding of how HIV infects a cell and replicates its genes and how cutting-edge research aims to move from lifelong treatment to curing an infected person. And the use of music to help non-academic audiences to engage with virology research also offered the potential to provide



The Hearing HIV project was funded and supported by:

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- Public Engagement with Research unit, University of Southampton
- London Teaching Centre of Immunology, King's College London
- Department of Music, University of Southampton
- Turner Sims and Guy's Chapel

insights into practice-led research themes in contemporary composition.

Ben explained, “*The Virus Within: Hearing HIV*” is a three-movement composition that musically depicts the biological processes involved in HIV integration, gene expression and how innovative ‘Shock and Kill’ treatments might provide a cure for HIV. The musical materials undergo conceptually similar processes or transformations that occur at the molecular and cellular level. The music features disjointed grooves, whistles and duck calls, complex systematic musical processes developed from biological principles, whimsical chords, sirens and gnarly electronics!

“Chad and I wanted to ensure the composition created was both biologically correct and musically accurate. Our work together led to us gaining an in-depth understanding of each other’s fields of work to a point where I once found a cut and paste error he had made in a DNA base sequence.”

The music was premiered at Guy’s Chapel at King’s College London by Workers Union Ensemble, of which Ben is the conductor,

in February 2018. It was performed again at the University of Southampton Science and Engineering Festival 2019 and will be performed later this year in London as its reach and relevance continues to grow.

Following its London debut the piece received some fantastic audience reviews including:

- *Novel, exciting and inventive, complex piece*
- *Brave, cool, excellent*
- *Intriguing, insightful and thought provoking*
- *Head on crash with virus*
- *Interesting but slightly anxiety inducing!*
- *Mystery discovering creativity and hope!*
- *Brilliant translation: science to music Thank you! One of the best pieces of scientific performance art I’ve ever seen/ heard. Incredibly intellectually rewarding. Wonderful!*
- *Top science/music mash-up*
- *A structurally chaotic masterpiece!*

Ben is continuing to pursue his interest in arts-science collaboration through a new project called *Pythagoras’s Toolkit*, led by Ensemble Paramirabo (Montréal). In this project, Rachel Warr, co-created and director of Dotted Line Theatre, and Ben will bring to life, through puppetry and live music, a modern-day Pythagoras who will explore sound, space, rhythm, harmony and dissonance, instrument making/design, dance, musical textures and ways of constructing music.

Aimed at children aged three and above, as well as adults, *Pythagoras’s Toolkit* will encourage the audience to be interested in experimentation, in making mistakes to find answers, and to think about how music is made and can be manipulated in time. The production will feature musicians from Ensemble Paramirabo (Canada), Workers Union Ensemble (UK) and two musically literate puppeteers working with a specially created Pythagoras puppet.

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**Dr Ben Oliver**  
Head of Music

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