

further information

Articles:

Being a Christian in Research. Another leaflet in this series, available at www.cis.org.uk/resources/articles-talks-and-links/students/

Books:

Alexander, D., *"Rebuilding The Matrix"* (2001)
ISBN 978-0745912448

Alexander, D., *"Creation or Evolution: Do We Have To Choose?"* 2nd ed. (2014)
ISBN 978-0857215789

Holder, R. D., *"Nothing But Atoms and Molecules?"* (1993)
ISBN 978-1854242365

Collins, F., *"The Language of God"* (2007)
ISBN 978-1847390929

McGrath, A., *"Dawkins' God: Genes, Memes and the Meaning of Life"* (2004)
ISBN 978-1405125383

Berry, R. J. & Noble, T. S., (eds), *"Darwin, Creation and the Fall"* (2009),
ISBN 978-1844743810

Useful Websites:

Christians in Science: www.cis.org.uk

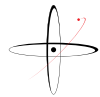
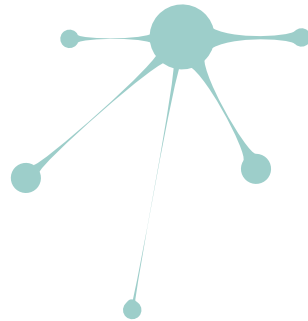
ASA, CiS's US sister organisation: www.asa3.org

Be Thinking: www.bethinking.org/science-christianity/

Biologos: biologos.org/

The Faraday Institute: www.faraday-institute.org

Test of Faith: www.testoffaith.com



CHRISTIANS · IN · SCIENCE

General Secretary secretary@cis.org.uk

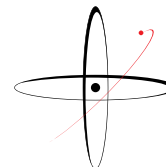
Development Officer do@cis.org.uk

Executive Officer eo@cis.org.uk

Christians in Science Ltd., incorporated in England and Wales.

Registered address: 4 Sackville Close, Sevenoaks, TN13 3QD Company No. 05959444. Registered Charity No. 1121422

being a christian in
biochemistry



CHRISTIANS · IN · SCIENCE

studying biochemistry as a christian

The amazing intricacy of life at the cellular and molecular level speaks to a Christian of the majesty and sheer ingenuity of a remarkable Creator. Yet many biochemists dismiss God as either incompatible with Science or irrelevant. How does the Christian respond? How do we believe in a divine creator despite the compelling evidence for evolution by random mutation and natural selection? What ethical constraints apply to the use of genetic engineering and animal models? This leaflet aims to encourage you in your calling as a biochemist and provide some advice on dealing with common challenges associated with being a Christian in biochemistry.

about the authors



Michael Newton studied biochemistry as an undergraduate at Southampton University. After serving as a church intern for one year, he moved to Cardiff University to join a four-year Integrative Neuroscience

PhD program, investigating the role of extracellular calcium in the development of the nervous system, under Professor Alun Davies. He became a Christian as a child, God never gave up on him as a teenager, and in University he discovered the joy of worshipping God through science.



Andrew Halestrap is a Fellow of the Academy of Medical Sciences and Emeritus Professor of Biochemistry at Bristol University. His research interests include the role of mitochondria in health and disease and the transport

of monocarboxylates (e.g. lactate and pyruvate) across cell membranes. Following a Christian upbringing, he made his own commitment to Christ as a teenager and continues to be energised by a faith that impacts every aspect of his life, including his research and teaching.

biochemistry as a calling

Scripture teaches that God reveals himself through his creation. The Psalmist proclaims “The Heavens declare the glory of the Lord and the skies proclaim the work of His hands” (Ps 19:1). Elsewhere he states “Great are the works of the Lord; they are pondered by all who delight in them” (Ps 111:2). The first part of this verse is displayed (in Latin) over the entrance to The Cavendish Laboratories in Cambridge. Indeed, many scholars would argue that a Christian world-view enabled the rise of modern science. The pioneering scientists of the seventeenth and eighteenth centuries such as Galileo, Kepler and Newton saw their studies as a proper response of worship to the creator God and consistent with the command to be good stewards of his creation (Genesis 1:28). A greater understanding of the workings of God’s creation would enable a better use of its resources for the benefit of all mankind. Thus the 1663 Charter of the Royal Society states “[The Royal Society’s] studies are to be applied to further promoting by the authority of experiments the sciences of natural things and of useful arts, to the Glory of God the Creator, and the advantage of the human race.”

As Christian biochemists we continue in this tradition, remembering that both the nature and the manner of our studies should bring glory to God. As the Apostle Paul wrote “Whatever you do, whether in word or deed, do it all in the name of the Lord Jesus, giving thanks to God the Father through him” (Col 3:17). While

all Christians should strive to work in a manner that honours God, the Christian biochemist has a special privilege. As we unravel the intricate and sophisticated molecular mechanisms operating within cells, we cannot help but wonder at God’s glory revealed in the minutest detail of his creation. This natural response to God’s “Works” is reinforced by God’s revelation in scripture, his “Word”. Here we read that, much as God’s spoken command brought creation into being (Genesis 1), all things were made through the Word (or logos, God’s logical self-expression – John 1:1-3). This same Word became man in Jesus (John 1:14) who not only created (Col 1:16), but also sustains all things (Heb 1:3).

What could be more natural than to worship the God who reveals himself through the exquisite molecular mechanisms underlying life?

Thus as Christians we study biochemistry knowing that Christ ultimately stands behind the ordered mechanisms of life; a consistent God upholding a consistent Universe whose resources we can harness for the good of mankind. What could be more natural than to worship the God who reveals himself through the exquisite molecular mechanisms underlying life?

In today's tough economic climate, research scientists are increasingly expected to demonstrate the wider impact of their research with greater pressure to pursue "translational" projects – those with direct commercial or medical applications.

The secular biochemist can argue the case for basic research on the basis that only as we understand how things work can we exploit their translation potential. However, the Christian biochemist can offer a fresh perspective. We affirm the intrinsic value of knowledge in its own right as a proper response of worship to our creator God, yet recognise the value of translational research as good stewardship of God's creation and a means of bringing his healing to a broken world.

A greater understanding of the workings of God's creation would enable a better use of its resources for the benefit of all mankind.

biochemistry and christianity – common challenges

Working as a biochemist is exciting and rewarding, but for the Christian it can be a hostile environment that poses both philosophical and ethical challenges. In this section we take a look at some of the common challenges faced by Christians in biochemistry.

is faith irrational?

"Faith is the great cop-out, the great excuse to evade the need to think and evaluate evidence. Faith is belief in spite of, even perhaps because of, the lack of evidence."

**– Richard Dawkins
(Edinburgh International Science Festival, April 15, 1992)**

Most biochemists probably accept Dawkins' cynical and inaccurate definition of faith and regard belief in God as incompatible with science, even if

they do sometimes describe a molecular structure as "perfectly designed for its purpose"! Consequently the biochemist who admits to being a Christian can occasionally be subject to scorn or ridicule, although this is more often born out of ignorance and prejudice than informed reason. However, this can provide a God-given opportunity (and responsibility) to explain how the realms of science and religion fit consistently together and so provide a powerful apologetic against an increasingly important stumbling block to faith.

[Being a Christian Biochemist] can provide a God-given opportunity (and responsibility) to explain how science and religion fit consistently together.



creation and evolution

Evolution is a key unifying theory in biochemistry. However, there are many in our churches who regard the Biblical account of creation as incompatible with evolution, as do the majority of secular scientists. The Christian biochemist can be faced with considerable opposition from both sides of the debate, and the issue can become a real pressure point if one wants to uphold the authority of Scripture but recognise the power and integrity of science. In fact most Christian biochemists regard such polarised views as both unnecessary and unhelpful and would regard all truth as God's truth whether revealed through scripture or science. This was expressed by Francis Bacon (1561-1626) – "God has laid before us two books or volumes to study, if we will be free from error; first the Scriptures revealing the will of God, and then the creatures expressing his power".

So today Francis Collins can say "a committed Christian need not fear evolution, but can embrace it as God's awesome means of creation". This requires no distorted interpretation of either the scientific data or the Biblical texts. For those wishing to explore this issue in much more depth, Denis Alexander's "Creation or Evolution: Do we Have to Choose?" provides an excellent starting point and "Darwin, Creation and the Fall" (R. J. Berry & T. A. Noble, Eds) is a great place to explore some theological consequences of evolution.

This is a key area for the Christian biochemist to think through and provides an opportunity for service, as

the perspective of scientifically trained believers may be sought by both non-Christian colleagues and Christians without scientific training.

Today Francis Collins can say "a committed Christian need not fear evolution, but can embrace it as God's awesome means of creation".

science and ethics

Christian biochemists will wish to affirm ethical boundaries already in place for research, such as regulations to minimise pain, distress or lasting harm to animals, safeguards against irresponsible practice in the use of pathological or genetically engineered organisms, and the prevention of plagiarism or scientific fraud. However, there are other ethical areas where Christians may feel the need to take a different position from their non-Christian colleagues. One example is the use of cells derived from human embryos for research or the repair of damaged or diseased tissues. Another is the application of genetic engineering to reverse undesirable inherited traits or enhance performance. In deciding what position to take on these ethical questions the Christian biochemist will first seek to understand the relevant teaching from Scripture. However, often the Bible will not address these issues directly and it will be necessary to discern

what scriptural principles apply and how. This may not always be a straight-forward task! Although Christian biochemists may reach different conclusions, each has the responsibility to ask what moral and ethical questions are posed by their research before they commit to a project, and then to try and discern what constraints Scripture imposes.

reductionism

Is it possible to provide a complete explanation of love, beauty, or consciousness on the level of atoms and molecules? While this may not be the case now, is it possible that one day it will be? Stephen Hawking and Richard Dawkins certainly think so. So did Francis Crick, who once stated:

"The ultimate aim of the modern development in biology is in fact to explain all biology in terms of physics and chemistry."

– F. Crick, *Of Molecules and Man*. p10

However, a great many Christian thinkers and scientists would disagree, and it is worth considering why. The point in question relates to what many describe as the fallacy of Reductionism – critically branded "Nothing-buttery" by the late Professor Donald MacKay of Keele University – that is both clearly described and refuted by Rev. Dr Rodney Holder in his book "Nothing But Atoms and Molecules?". Holder recognises three ways in which the term "reductionism" is used:

"Methodological reductionism means breaking down objects into their constituent parts in order to study them; epistemological reductionism denotes the notion that higher level sciences are explicable in terms of lower level ones; and ontological reductionism means that a scientific explanation for any phenomenon is the sole explanation."

– R. Holder, *Nothing But Atoms and Molecules?* p 72

Methodological reductionism as described above will be very familiar to any biochemist, as it is the basic approach of our discipline! It has been astonishingly successful and useful in the understanding of the molecular mechanisms by which life works. But we should all recognise the need of a more holistic approach in some situations: for example, we must check, not assume the in vivo relevance of our findings in vitro. So are molecular mechanisms all there is? Is the whole nothing but the sum of the parts? Many would urge caution here, and the Christian biochemist should take care: such thinking may be especially appealing to those trained in methodological reductionism, but epistemological and ontological reductionism run into both scientific and theological difficulties.

Andrew Halestrap and Michael Newton