

Discovery could improve the lives of premature babies

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Scientists funded by the Biotechnology and Biological Sciences Research Council (BBSRC) have identified a potential new avenue for altering lung development in the embryo which may help to improve the outcome for very premature babies. The researchers at Cardiff University, in collaboration with those at the Saban Research Institute at Los Angeles Children's Hospital, have discovered a key player in early lung development which is a potential drug target for treating very premature babies with small, immature lungs.

The research is published today in *The Journal of Physiology*. The work was carried out in the laboratories of Dr Daniela Riccardi and Professor Paul Kemp (School of Biosciences, Cardiff University, UK) in collaboration with Professor David Warburton (Saban Research Institute, Childrens Hospital Los Angeles, USA).

Dr. Riccardi said: "Within minutes of birth, a baby relies solely on its lungs to get the oxygen it needs. One of the reasons that the lives of very premature babies are in such dire jeopardy is that the final stages of lung development happen very late in pregnancy and so premature babies are born with immature lungs that struggle to take in enough oxygen. Under-developed lungs don't absorb enough oxygen and premature babies with respiratory problems often develop chronic lung disease that may extend into adulthood. Through our research we have gained a better understanding of how lungs develop normally and so we can now begin to work out what happens when things go wrong, such as when a baby is born much too early. From the work we have published today, we now

have a real possibility for fast-tracking new drugs for helping these very premature babies."

Along with their research associates Dr Brenda Finney and Dr William Wilkinson, Dr Riccardi and Professor Kemp have discovered that a molecule called CaR (calcium receptor) is a crucial factor in the control of lung development in the womb. CaR co-ordinates messages from within the growing fetus that instruct the lungs to develop thousands of channels and tiny air pockets. This complicated structure is what will ultimately allow oxygen to move from the air into the baby's blood stream.

Professor Kemp said: "The really exciting thing about CaR is that there are already drugs available that can alter its function and, therefore, could modulate lung development. We know that CaR works by sensing calcium and we also know that there are already drugs available that are designed to regulate how calcium is used in the body. If we can show that one of these drugs can modulate the action of CaR in the lung, it could be used to mature the lungs of a very premature baby as it grows. Better still, an existing drug could potentially be approved much more quickly than a new one."

Professor Janet Allen, BBSRC Director of Research said: "It is exciting to see that BBSRC-funded research has the potential to improve the lives of thousands of very premature babies. These scientists have shown that by first asking questions about a fundamental biological process, the possibilities for understanding and treating devastating human disease can then be thrown wide open. This demonstrates the value of basic research in biology for delivering real life impact."

More info: This work is published in The Journal of Physiology, "Regulation of mouse lung development by the extracellular calcium-sensing receptor, CaR" DOI:10.1113/jphysiol.2008.161687

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