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| **Scientists have found a new group of proteins that could boost the effectiveness of vaccinations, making it much easier to immmunise newborn African children.**  **This discovery, carried out by a multinational team including researchers at** [**Medical Research Council (MRC) The Gambia**](http://www.mrc.gm) **and Imperial College London, could help refine vaccines so that they are specifically designed to work with a newborn’s immune system and go some way to helping the millions of children under five who die each year from infections such as pneumonia and diarrhoea.**  Infectious diseases are a huge cause of infant mortality globally, in part because newborns do not yet have a sophisticated enough immune system to respond to most vaccines.  The study showed in the laboratory that a group of proteins called "toll-like receptors" (TLRs) could be added to existing vaccines to help stimulate aspects of newborns’ immune systems so that the vaccines would offer better protection against infection.  The ability to immunise newborns would not only close a baby’s window of vulnerability to serious infections during the first months of life, such as pneumococcus, which causes pneumonia, and rotaviruses, which cause severe diarrhoea, but it would also allow for vaccinations to be offered at birth rather than waiting until infants are a few months old.  This could offer a huge benefit to parents of young children, particularly in developing countries with fewer resources, where it is harder to track how many children have been vaccinated and at what age.  In the current study published today in [*PLoS ONE*](http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0018185), the team treated blood samples from 120 Gambian infants with a panel of different TLR stimulators, and measured how they each stimulated the infants’ production of cytokines, a key part of the immune system.  The infants ranged from newborn to 12 months of age, allowing the researchers to examine how the effects of this treatment differed according to age and to see if immunity could be sustained over time.  The team found that one stimulant in particular, known as TLR8, helped boost the immune system throughout the first year of life.  The research was funded by the [Medical Research Council](http://www.mrc.ac.uk) (MRC) (UK), the [Bill & Melinda Gates Foundation](http://www.gatesfoundation.org/Pages/home.aspx) and the US [National Institutes of Health](http://www.nih.gov/), and led by [Dr Sarah Burl](http://www1.imperial.ac.uk/medicine/people/s.burl/) of [MRC The Gambia](http://www.mrc.gm) and Imperial College London and Dr Katie Flanagan of [MRC The Gambia](http://www.mrc.gm) in collaboration with Dr Ofer Levy of [Children’s Hospital Boston](http://www.childrenshospital.org), [Harvard Medical School](http://hms.harvard.edu/hms/home.asp).  [Dr Sarah Burl](http://www1.imperial.ac.uk/medicine/people/s.burl/) who co-led the study at MRC The Gambia and is currently in the [Department of Medicine](http://www1.imperial.ac.uk/departmentofmedicine/) at Imperial College London says: “Our international collaboration with Children’s Hospital Boston at Harvard Medical School in the US highlights the importance of such infant studies at the Medical Research Council in The Gambia.  These results suggest use of TLR8 could help improve vaccine responses, reduce the number of immunisations given to each child and hopefully go some way to tackling the number of young children dying from infections, especially in vulnerable areas of the world.”  Dr Ofer Levy at the Children’s Hospital Boston, part of the Harvard Medical School, adds: “The adjuvant could be combined with any vaccine, and if things work well, it could provide single-shot protection at birth.  We view this as the first chapter in our collaboration, the start of great things to come.”  Vaccinology, the study of vaccines, plays a central role in the work carried out at MRC The Gambia and has led to landmark studies in the fight against illnesses such as tuberculosis, malaria and pneumonia.  The MRC aims to continue its leading role in tackling infections which impact so heavily on the health and wellbeing of populations in resource-poor settings.  The results are published in the open-access journal [Public Library of Science (PLoS) ONE](http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0018185).  **See also:**   * [*PLoS One* article](http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0018185) * [Medical Research Council](http://www.mrc.ac.uk) * [MRC The Gambia](http://www.mrc.gm) * [Children's Hospital Boston](http://www.childrenshospital.org)   **Notes to editors**  1. About the Medical Research Council  For almost 100 years the Medical Research Council has improved the health of people in the UK and around the world by supporting the highest quality science. The MRC invests in world-class scientists. It has produced 29 Nobel Prize winners and sustains a flourishing environment for internationally recognised research. The MRC focuses on making an impact and provides the financial muscle and scientific expertise behind medical breakthroughs, including one of the first antibiotics penicillin, the structure of DNA and the lethal link between smoking and cancer. Today MRC funded scientists tackle research into the major health challenges of the 21st century. [www.mrc.ac.uk](http://www.mrc.ac.uk)  2. About MRC The Gambia  Established in The Gambia in 1947, MRC The Gambia is the UK’s single largest investment in medical research in any developing country. The Unit has 4 field sites including one based in Guinea Bissau and an established staff complement of about 200 scientists, clinicians and senior administrative staff from many parts of the world The Unit’s research focuses on infectious diseases of immediate concern to The Gambia and the continent of Africa, with the aim of reducing the burden of illness and death in the country and the developing world as a whole. For more information, visit [www.mrc.gm](http://www.mrc.gm)  3. About Children’s Hospital Boston  Children’s Hospital Boston is home to the world's largest research enterprise based at a pediatric medical center, where its discoveries have benefited both children and adults since 1869. More than 1,100 scientists, including nine members of the National Academy of Sciences, 12 members of the Institute of Medicine and 13 members of the Howard Hughes Medical Institute comprise Children's research community. Founded as a 20-bed hospital for children, Children’s today is a 392-bed comprehensive center for pediatric and adolescent health care. Children's also is the primary pediatric teaching affiliate of Harvard Medical School. For more information about research and clinical innovation at Children’s visit: [www.childrenshospital.org.](http://www.childrenshospital.org.)  4. About Imperial College London  Consistently rated amongst the world's best universities, Imperial College London is a science-based institution with a reputation for excellence in teaching and research that attracts 14,000 students and 6,000 staff of the highest international quality. Innovative research at the College explores the interface between science, medicine, engineering and business, delivering practical solutions that improve quality of life and the environment - underpinned by a dynamic enterp rise culture.  Since its foundation in 1907, Imperial's contributions to society have included the discovery of penicillin, the development of holography and the foundations of fibre optics. This commitment to the application of research for the benefit of all continues today, with current focuses including interdisciplinary collaborations to improve global health, tackle climate change, develop sustainable sources of energy and address security challenges.  In 2007, Imperial College London and Imperial College Healthcare NHS Trust formed the UK's first Academic Health Science Centre. This unique partnership aims to improve the quality of life of patients and populations by taking new discoveries and translating them into new therapies as quickly as possible.  Website: [www.imperial.ac.uk](http://www.imperial.ac.uk) |