

The lactating mammary gland: An overview of research from down under

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In 1972 I moved from the University of Sydney to The University of Western Australia. Coincidentally this was a very significant time in human development because the gradual decline in the proportion of women choosing to breastfeed was arrested in most Western countries. In Australia at that time fewer than 50% of women chose to breastfeed their babies. Since 1972 there has been a progressive increase in breastfeeding and now in Australia approximately 96% of women choose to breastfeed their babies. I initiated my studies into the regulation of milk synthesis in women in 1972 and I clearly remember a member of the National Health and Medical Research Council, Grants Committee asking me at interview why I wanted to do research on these *unusual* women i.e. breastfeeding mothers. It obviously was not viewed as a positive career move at that time. On the other hand being the odd one out in one of the most isolated cities in the world has had its advantages. Perhaps the greatest advantage was that the Australian Breastfeeding Association had recently formed a branch in Perth and my request for subjects to participate in my studies was met with overwhelming enthusiasm. My transformation from research into lactation in farm animals to women was also facilitated by both the encouragement and practical support from my first human lactation subject, my wife Robyn.

Over the past 42 years, 58 PhD students have completed their postgraduate degrees under my supervision and much of the credit for the research carried out in my laboratory can be attributed directly to the efforts and creativity of these students. From success in developing sensitive assays to measure the macro- and micro-components of breastmilk, non-invasive methods to measure milk synthesis and milk production in women, to the current use of ultrasound to explore the anatomy of the lactating breast, milk ejection and infant sucking gastric function and body composition have all depended for their success on the abilities of these postgraduate students as well as our recent discovery of stem cells in expressed breast milk

However, the quest for knowledge about the physiology of the lactating breast continues and many problems remain to be solved. The nature and interaction between the local and systemic molecular mechanisms regulating breastmilk synthesis are poorly understood. Is the contradiction between social attitudes and the basic *calm and connecting* biology of successful lactation causing the unacceptably high incidences of painful nipples and mastitis in Western women? Many factors such as the function of lactose in milk, the very low concentration of nutritive proteins in human milk, the physiology of the change in the fat

content of milk during and following a breastfeed and the role of mammary stem cells and immune cells in successive lactation cycles to name but a few issues that are poorly understood and await further investigation.

Nevertheless, the question still remains “How is it that we know so little about an organ that consumes >30% of daily energy intake and contributes so much to intellectual, physical development and health of both the mother and baby”? The lactating mammary gland must be accorded the same medical and scientific status as other equivalent organs in the body. Once we have a volume of basic research on human lactation that is equivalent to that for other organs in the body (heart, brain, GI Tract etc), breastfeeding mothers will be able to be supported by a Medical Specialty in Human Lactation. When this is achieved, those of us researching this fascinating organ will no longer be viewed as studying *unusual* women.

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