63. WHEAT GERM AGGLUTININ INDUCED TYROSINE PHOSPHORYLATION OF HUMAN SPERMATOZOA

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Acquisition of the ability to fertilise the egg is conferred on mammalian spermatozoa during their transit through the female reproductive tract. This process, termed capacitation, represents the culmination of a series of complex physiological and biochemical changes. Among the correlates of this process, the phosphorylation of tyrosine residues on multiple sperm proteins appears to be critically important for subsequent sperm-egg interaction. In this study, we report the novel finding that the binding of the lectin, wheat germ agglutinin (WGA) to human spermatozoa elicits a dose-dependent increase in tyrosine phosphorylation. Interestingly, this response appears to be specific to the WGA lectin, which possesses dual binding specificity for terminal N-acetylglucosamine (GlcNAc) and sialic acid residues. Other lectins, which possess binding specificities for either GlcNAc or sialic acid alone, were not capable of eliciting a similar response. In addition, this response appears to display some species specificity given that we were unable to elicit a similar effect in mouse spermatozoa. The mechanism through which WGA elicits an increase in tyrosine phosphorylation and the physiological significance of the process remains to be elucidated. However, preliminary evidence has led to the hypothesis that the lectin mimics a protein(s) present within the female reproductive tract. The binding of such a protein to human spermatozoa presumably induces an aggregation of a specific receptor(s) on the surface of these cells. This aggregation, in turn, activates a cyclic adenosine monophosphate (cAMP) dependent signal transduction cascade that involves Src family kinases. Future work will be directed to elucidating the identity of the sperm receptor(s) and the precise nature of the signal transduction pathway involved.

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