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Cell labeling by chromosome changes for monozygotic twinning and its implications

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The origins of pairs of monozygotic twins and higher order multiples, i.e. triplets, quadruplets, etc., have been extensively studied but still little is understood. To gain insight into this event, certain possible cell labeling schemes that model an organism's development are analyzed. The phenomenon of quadruplet twins is exposed during the process. We predict that monozygotic quadruplets are not really quadruplets but instead are two pairs of monozygotic twins where the pairs slightly differ. From our analysis, we discover that the probability of monozygotic twins is $(1/2)K$, and the probability of monozygotic quadruplets, or triplets in the case of the death of an embryo, is $(1/8)K$, where K is a species-specific integer representing the number of pairs of homologous chromosomes. This investigation into twinning provides a foundation for understanding the process of cell development through which the cell development mechanism is established. The failure of the internal cellular clock from this mechanism may play an important role in cancerogenesis. The parameter K may determine cancerization with a probability threshold that is approximately inversely proportional to the Hayflick limit, so exposure to small levels of ionizing radiation and chemical pollution may not produce cancer.

Biography

Carol Jim is currently a PhD candidate working on her dissertation at The George Washington University in the School of Engineering and Applied Science. She is also an Adjunct Professor of Computer Science and Information Technology at Hood College where she received her MS in Computer Science and BA in Mathematics. She has published in peer-reviewed international conference proceedings on topics including network forensics, data mining and machine learning, and game theory.

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