Small changes make a big difference: Improving efficiency and quality through automation of G-banding

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To increase cost effectiveness in a changing health care climate, our lab sought to eliminate redundancy and improve productivity in the G-banding process. The current manual banding process requires one full time technologist. Recognizing that efficiency could be improved in this area, we developed a procedure that would utilize automation focusing on trypsin time and environmental conditions as well as rearranging processes upstream of slide preparation. The laboratory analyzed 46 cases in this method comparison study which included two specimen types, bone marrow and peripheral blood. This accounted for several culture types used for specific cell lineages, giving a total of 105 slides paralleled. Corresponding slides were examined by technologists using qualitative and quantitative assessments like mitotic index and banding quality. This study showed that humidity levels between 18%-38% were most favorable with the banding procedure tolerable up to 55%. The optimal temperature ranged from 18°C-24°C. Culture types were dropped and aged concurrently therefore eliminating another variable impacting by the trypsin treatment. When environmental conditions remain consistent the trypsin time was directly proportional to cell concentration. Furthermore, we found that automation improved banding consistency and efficiency, and increased throughput. The ability to automate a staining procedure resulted in a 64% decrease in the banding time, equivalent to approximately 0.4 full time technologists per year. With over 3000 cases in 2013, the additional time was allocated to process improvements in other areas of the laboratory and test development.