CC/NUMBER 14
APRIL 6, 1981

This Week's Citation Classic

Seabright M. A rapid banding technique **for human chromosomes.**
Lancet **2**:971-2, 1971.
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A method for banding human chromosomes using trypsin is described. The procedure is rapid and economical. Slides ready for observation can be obtained within ten minutes. [The *SCI*® indicates that this paper has been cited over 1,085 times since 1971.]

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March 18, 1981

"The trypsin-bands story really began in 1967 while examining a chromosome preparation stained with Leishman. To my surprise I noticed the presence of strange stripes across the chromatids. Intrigued by this observation I sought the opinion of senior cytogeneticists regarding the possible significance of this phenomenon. Alas, they were not impressed. The prompt and unanimous verdict was: artifacts! Laboriously, I then tried to reproduce this picture by retracing every step of the staining schedule, even adding to the stain a few drops of Nescafé coffee because I remembered drinking it at the time. Nothing happened. . In retrospect, I must have used a pipette contaminated with trypsin which had been previously used for harvesting a culture of fibroblasts, hence the bands.

"Four long years went by before T Caspersson[1] discovered that quinacrine mustard (QM) had the property of producing fluorescent bands along the chromosomes. This method, which allowed the identification of each chromosome, was indeed a great step forward, but one felt that the resolution of the bands needed to be improved. Thus, among other things, I wondered if uncoiling the chromatid strands artificially before staining with QM would enhance the differentiation of the bands. I recalled that trypsin had been used in the past in order to 'relax' the coils of vicia faba chromosomes. This prompted me to try this method on human material. The first attempt resulted in a ghastly mess, but miraculously a few metaphases, which escaped the drastic effect of a very prolonged immersion in the trypsin solution, showed banding patterns similar to those observed on my ill-fated 1967 slide. And, moreover, they were comparable to the QM bands. This time I was aware of their significance! It took only a few days to establish the optimum conditions, obtain reproducible bands, standardize the method, and publish it. The immediate application was to determine the location of break points in naturally occurring chromosome rearrangements (translocations, etc.) in patients with congenital defects and to study the lesions and patterns of exchange induced by X-irradiation.[2]

"The main reasons why trypsin-banding is perhaps more widely used than other methods include its simplicity, low cost of reagents, speed of operation and, of course, the ability to produce good bands. These are important factors when choosing a technique for routine cytogenetics investigations. I have published several more recent articles in the field."[3-7]

1. **Caspersson T, Lomakka** G *&* Zech L. The 24 fluorescent patterns of the human metaphase chromosomes. *Hereditas* (Lund) **67**:89-102. 1971.
2. **Seabright M.** High resolution studies on the patterns of induced exchanges in the human karyotype. *Chromosome* (Berlin) **40**:333-46. 1973.
3. **Seabright M** *&* **Lewis G M.** Interstitial deletion of chromosome 7 delected in three unrelated patients. *Hum Genet* **42**:223-6. 1978.
4. **Seabright M, Gregson N, Pacifico E, Mould S. Ryde J, Pearson I & Bradley A.** Rearrangements involving four chromosomes in a child with congenital abnormalities. *Cytogenet Cell Genet* **20**:150-4. 1978.
.V **Pearson M D, MacLean N & Seabright M.** Silver staining of nucleolar organizer regions in the domestic cal. Felis *catus Cytogenet. Cell Genet* **24**:247-54. 1979.
6. **Williamson E M, MillerJ F & Seabright M.** Pericentric inversion (13) with two different recombinants in the same family *J. Med. Genet* **17**:309-12. 1980.
7. **Seabright M,** Gregson N M & Johnson M. A familial polymorphic variant of chromosome 5. *J Hum Genet* **17**:444-6. 1980.