THE COLOUR INDEX (CI) AND HISTOLOGICAL STAINS

Sir,

The largest single user of dyes is the textile industry, where dyers may classify them according to their mode of action, i.e. mordant or direct, their general chemical character, i.e. acid or basic, or their colour. Unfortunately many dyes have one or more synonyms, e.g. brilliant crystal scarlet 6R

is also known as crystal ponceau 6R, naphthalene scarlet 6R and ponceau 6R. For this reason a uniform nomenclature for dyes is particularly important if consistent results are to be obtained.

The response of the industrial dyers to this rich source of error was to set up a Colour Index (CI), whereby each chemical structure is given a unique number and a unique generic name, i.e. not a trade name. This Colour Index, first introduced by the Society of Dyers and Colourists of Bradford, England (1924)[1] is now compiled as a 6-volume reference source in association with the American Association of Textile Chemists and Colorists (1971–75).[2]

The result of this is that dyes which are common to both histology and the textile industry can be accurately identified by their Colour Index number (CI number), a selection of which are detailed in Table 1. However, it can be seen from Table 1 that the CI names appear slightly obscure and it is likely (and even preferable) that the classical names will continue to be used in the histology laboratory for many years to come. Nevertheless, it is useful for the laboratory scientist to know of their existence. It should be borne in mind that dyes that are mixtures of chemicals (such as carbol fuchsin) will not have a CI number.

Table 1. Colour Index of some common dyes

CI number	CI name	Classical name
41000	Basic yellow 2	Auramine
42510	Basic violet 14	Basic fuchsin
22120	Direct red 28	Congo red
45380	Acid red 87	Eosin Y
75290	Natural black 1	Haematoxylin
42095	Acid green 5	Light green
52015	Basic blue 9	Methylene blue
50040	Basic red 5	Neutral red
42520	Basic violet 2	New fuchsin
26125	Solvent red 27	Oil red O
16230	Acid orange 10	Orange G
10305	Trinitrophenol	Picric acid
45170	Basic violet 10	Rhodamine B
75100	Natural yellow 6	Saffron
26150	Solvent black 3	Sudan black B
52040	Basic blue 17	Toluidine blue

A further standardization of dyes used in the histology laboratory has been carried out by the American Biological Stain Commission.[3] In addition, as new histological stains are made they are certified by the Commission and listed in their journal, *Stain Technology*.

Despite the better understanding of chemical composition and the more rational identification of dyes, variation in staining characteristics from one batch to another, and from one manufacturer to another, does occur. For this reason it is recommended that if there is any doubt, new batches of dye should be tested with known control material.

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References

[1] Society of Dyers and Colourists. *Colour index*. Bradford: Society of Dyers and Colourists, 1924.
[2] Society of Dyers and Colourists and the American Association of Textile Chemists and Colorists. *Colour index*, 3rd edn. London: Lund Humphries, 1971–5.
[3] Lillie RD. H J *Conn's biological stains*, 9th Edn. Baltimore: Williams & Wilkins, 1977.