detectable by immunoblotting.

(3) Brush cells display high enzyme histochemical activity for NADPH diaphorase. This NADPH-oxidizing activity is probably provided by a cytochrome P450 related domain of the NO synthase sequence[7]. NADPH is essential for NO generation.

(4) In brush cells, NADPH appears to be mainly delivered by glucose-6-phosphate dehydrogenase, which we find to be particularly abundant in brush cells by both immunostaining and enzyme histochemistry (*c* in the figure).

We conclude that brush cells in the stomach surface epithelium provide an intrinsic source of NO in the gastric lumen where NO, among other functions, may help to protect against gut pathogens, as suggested by Benjamin *et al.*[1]. As gastric brush cells display ultrastructural features shared by taste receptor cells but do not show any association with nerve fibres, it is possible that brush cells can sense the chemical milieu of the stomach contents and respond with the production of NO as messenger molecule and/or microbicidal agent.

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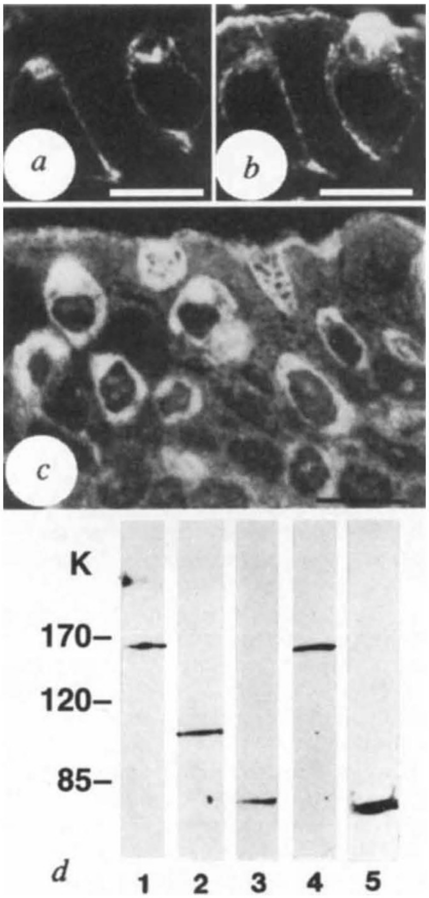

Enzymes involved in NO generation in brush cells of gastric epithelium (cardiac region) of the rat. *a,b*, Semithin tissue sections of unfixed freeze-dried and plastic-embedded tissue stained by immunofluorescence with antibody against synthase NO (*a*) and villin (*b*), a marker for brush cells[5] (scale bars, 10 μm). *c*, Demonstration of glucose-6-phosphate dehydrogenase (G6PD) by immunofluorescence in brush cells (grazing section) by an antibody against yeast G6PD that crossreacts with mammalian G6PD (ref. 8) (scale bar, 10 μm). *d*, Immunoblot analysis of electrophoretically separated proteins of the cardiac epithelium using antibodies against NO synthase (lane 1), villin (2) and G6PD (3). NO synthase and G6PD in the stomach show the same apparent relative molecular mass (electrophoretic mobility) as NO synthase of the rat cerebellum (4) and purified yeast G6PD (5), respectively.

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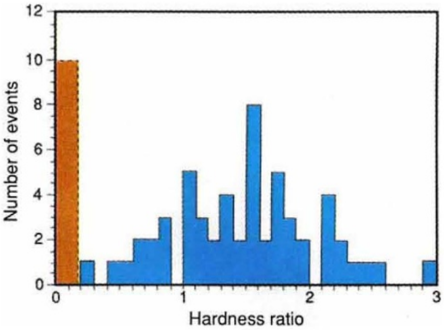
Gamma-ray bursts still a mystery

SIR — Several times in the past few months I have come across some confusion about whether soft gamma repeaters (SGRs) are some kind of repeating gamma-ray bursts (see, for example, ref. 1). On behalf of my colleagues in the BATSE team, I would like to clarify the matter.

The first two SGRs were discovered[2] in 1979 with instruments designed to detect gamma-ray bursts (GRBs); hence the origin of the confusion. Originally, they were classified as repeating, short, soft (low-energy) GRBs, for lack of more evidence. Their unusual characteristics were noted[2] but the subject remained closed until 1986, when it became clear with the discovery of the third source[3–5] that SGRs might be related to galactic populations[5]. Conversely, the BATSE results[6] strongly indicate that GRBs are extragalactic objects, and therefore that they are an altogether different kind of phenomenon.

When the Compton Gamma Ray Observatory was launched, the BATSE team had, as one of its main objectives, the detection of new SGR sources. Because of its high sensitivity, BATSE had a good chance of detecting SGR emissions of similar or weaker intensity than those detected previously. In our first three years of operation we detected[7,8] the reactivation of two of the old sources, but no new ones. This indicates that these objects are very rare in our Galaxy. The galactic (neutron star) nature of the objects has been argued for in the past[5,9]; the recent articles in *Nature*[7,10,11] in which SGR 1806–20 has been identified with a plerionic supernova remnant in our Galaxy confirm this hypothesis.



Frequency distribution of the hardness ratios of SGRs (orange) and short GRBs (blue).

Can we distinghish between SGRs and short GRBs? Or, in other words, how many SGR emissions have been misidentified in our database? To answer this question, I present here a histogram of the hardness ratios of the SGR emissions detected with BATSE, and of those of the short (< 2 seconds) GRBs detected during the first year of our operation. I define the hardness ratio as the ratio of the counts detected between 100 and 300 keV to those between 50 and 100 keV. The figure shows that there is a clear separation between the two types of events. We estimate that at most one SGR emission could have been mistaken for a GRB and vice versa. We are therefore confident that we can separate these two different types of transient phenomena based on their distinct spectral characteristics alone.

Finally, I would like to stress again the differences between SGRs and GRBs. The former are sources of randomly repeating, low-energy, very short emission, currently identified[7,10,11] with neutron stars in our Galaxy. The latter cover a wide range of durations and energies; they have not yet unambiguously been shown to repeat; and they are not compatible with the distribution of any known population of objects in our Galaxy. They remain one of the great unsolved mysteries in high-energy astrophysics.

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