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Brief communication

Serum free cell culture: The free access online database

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Abstract

The cultivation of cells in vitro is an important tool for biomedical research and production purposes. The supplementation of animal/human cell culture media with sera (components) of animal origin remains still standard, providing for e.g. necessary nutrition, shear protection, growth factors and cytokines. Because of undefined composition, risk of contaminations, the cost factor and also animal welfare considerations concerning the production of sera, the conversion to serum free alternatives is promoted by regulatory authorities, industry and the research community in general.

To support this trend and to help save one of the scientists most valuable resources—time—a data bank was compiled of commercially available formulations, searchable for products, applications, cell lines and manufacturers. The database is accessible free of charge in HTML format and as PDF download at http://www.zet.or.at, the informations are checked and updated twice a year. Problems concerning serum free cell culture are discussed at cellculture@zet.or.at and comments are welcome.

Keywords: Cell culture; Serum free; Chemically defined media; Product guide

1. Introduction

Animal cell culture was established for the production of viral vaccines in the 1940s/50s. Isolated cells need an artificial environment that allows growth, proliferation and differentiation. Substance requirements have to be met, waste must be disposed of or neutralized, respectively. The beneficial effects of serum supplementation are limited by several disadvantages: Serum is an ill-defined mixture, often contains adventitious agents and by-products like bacterial endotoxins or (immunogenic) contaminants. Furthermore batch qualities vary and the costs are high. Sera are a major source of viral contaminants (Merten, 1999; Jochems, 1997), which often do not produce cytopathic effects or morphological changes in cell cultures and furthermore, once present, are almost impossible to get rid of. Possible contaminants also include fungi, prions and bacteria/mycoplasma, which e.g. highly impair pharmacologic use of animal cell culture-derived products. Important advantages in the use of animal derived product free formulations and totally defined media are amongst others the avoidance of risks of contamination and immunogenic stimuli.

Last year, an issue of this journal featured an article on the controversial subject of serum usage for cell culture purposes (van der Valk et al., 2004), highlighting the problems of its harvest, trade and safety concerns for scientific as well as ethical reasons: serum free cell culture techniques were discussed, followed by a call for systematic gathering of data on alternatives. Recently, manuals on the topic and also reports of ongoing projects of searchable data banks have been published (Strebel and Fischer, 2003; Falkner et al., 2003, 2005; Focus on Alternatives, 2003, 2005), but the featured lists of alternative products, their applications and availability are in parts outdated, sometimes not free of

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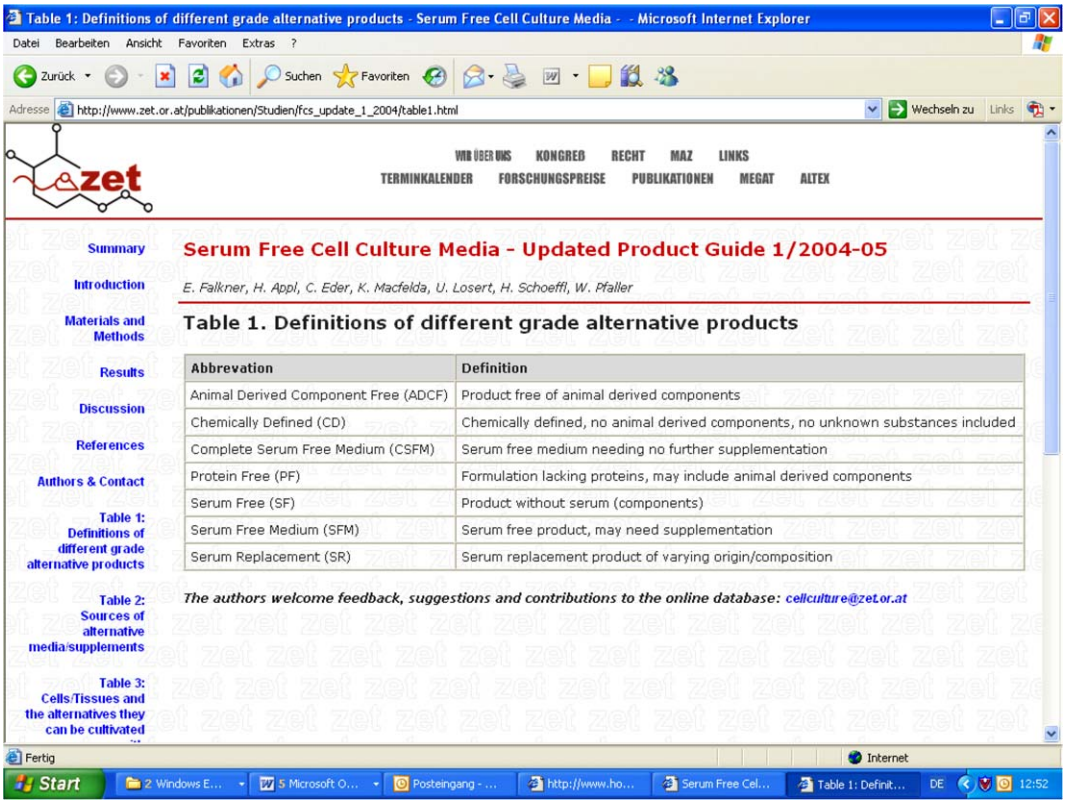

Fig. 1. Screenshot of definitions of different grade alternative products, link to serum free cell culture forum: http://www.zet.or.at.

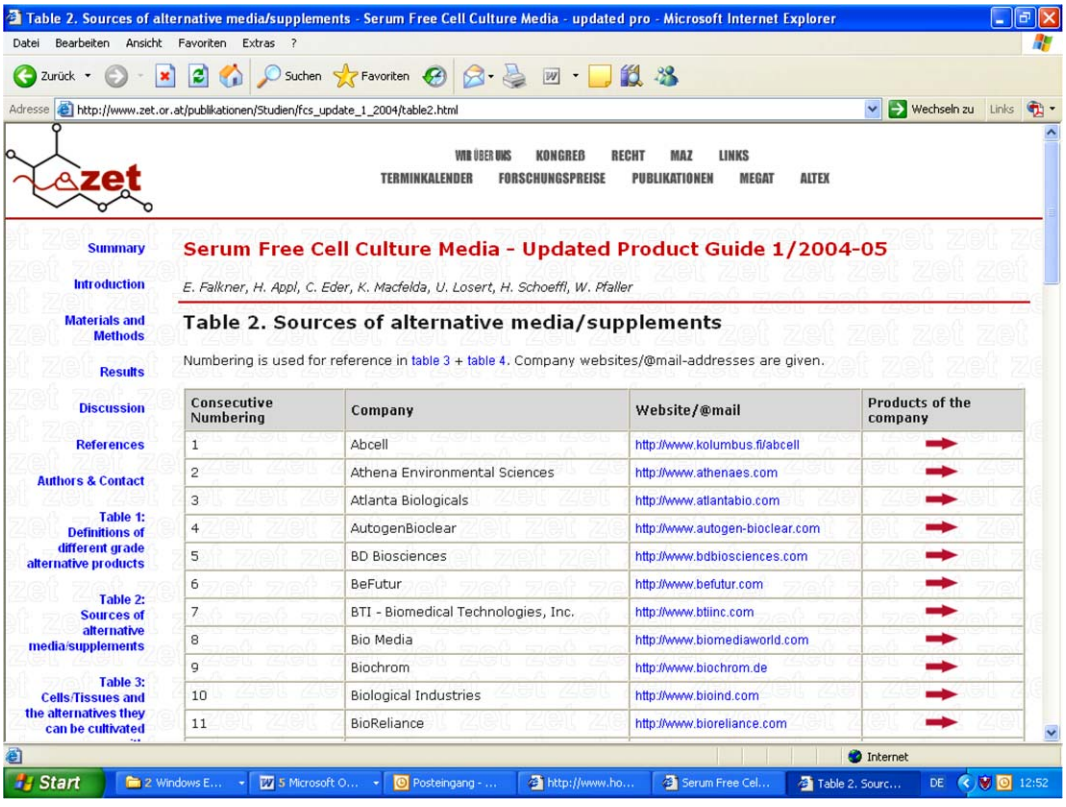

Fig. 2. Screenshot of the online database: Producers of alternative formulations linked to collections of their products: http://www.zet.or.at.

charge, behind announced time schedules, hard to track down and often incomplete.

As the authors wish to present, a much broader range of serum free speciality media/supplements are available from