

improved properties. A crucial part of this 'gene signature' discovery paradigm is access to human nerve cells that can be grown in culture under controlled conditions. One such system uses human neuronal stem cells that can be differentiated into neuronal systems that reflect the complexity of the CNS and include the multiple interactions between neurons, astrocytes and oligodendrocytes that most closely approximate the function of both the normal and diseased brain. Finally, discovery of drugs that act on the human CNS are best studied in human cell-based systems and differentiated neural stem cells present such an opportunity for MPHTSSM, providing drug candidates for families of new targets that will enable the discovery of therapeutics for complex psychiatric diseases.

Pharmacokinetics, pharmacogenomics and diagnostics

Examples of human systems that are suitable for *in vitro* studies of ADME properties include Caco2 cell lines for determining the relative permeability of different analogs of a given chemotype, human hepatic microsomal or S9 fractions of human or animal hepatocytes for determining metabolic stability and human blood cells for protein binding and metabolism studies. Norman Huebert (3-D Pharmaceuticals, Exton, PA, USA) gave a comprehensive overview of the way these human systems can aid the study of new drug candidates. Pharmacogenetics/genomics and diagnostics require blood samples for DNA analysis; however, assessment of gene expression levels in human cells is being considered as a potential pharmacogenomic or diagnostic predictor of drug response and as such will become a valuable tool.

Bioethics and legal issues

No discussion on the use of human tissues would be possible without a consideration of bioethical issues. Throughout this conference all speakers referred to,

and took significant steps to respect and adhere to, all bioethical guidelines on the use of human tissues. In particular, George Annas (Boston University, Boston, MA, USA) provided reasoned arguments about informed consent being 'informed', the appropriate restrictions on the use of information, the right of refusal and the potential impact on discrimination of employment and insurance when using genetic information or human materials. Many of the issues, such as confidentiality of information, are similar to those that are faced with all types of medical information, but there is a strong perception that genetic information is regarded as 'life's future diary'. Such a 'diary' of an individual reveals their potential for illness and could easily, if not properly protected, be the basis for discrimination. Privacy issues, state laws versus federal laws, legal issues, intellectual property rights, pass-through of benefit both medical and financial to the donor of tissue, ownership of material and, most importantly, the confidentiality issues were all addressed by Annas.

What to look for in stem cell and biorepository investing also raises several challenges. In addition to the normal requirements, stem cell and human tissue

investments raise several legal and bioethical issues and many of these points were elegantly elaborated as 'A Venture Capital Perspective on Investing in Stem Cell and Tissue Companies' by Michael Lytton (Oxford Bioscience Partners, Boston, MA, USA).

All participants at this first conference on the use of human tissue in target identification and drug discovery reached a strong consensus on the significant value for understanding these complex disorders and the potential to substantially increase the efficiency of the discovery and development of new therapeutics. Further symposia on this subject are being planned.

References

- 1 International Human Genome Sequencing Consortium (2001) Initial sequencing and analysis of the human genome. *Nature* 409, 860–921
- 2 Venter, J. *et al.* (2001) The sequence of the human genome. *Science* 291, 1304–1351
- 3 Editorial (2001) Biorepositories. *Start-up*, July/August, 19–27

Acknowledgements

I would like to thank Vinod Charles and C. Anthony Altar (Psychiatric Genomics) for help in the preparation of this report, and Pamela Levine (IBC, Westborough, MA, USA) for organizing the conference.

Erratum

Please note a correction to the *Private Prescription* article entitled *Formulating fortunes – the tale of a medicated lozenge*, published in *Drug Discovery Today*, 1st March 2002, Volume 7, No. 5, pp. 286–287. This article should have contained the following Table to go with its citation in column 3 on page 286.

The Editorial team of *Drug Discovery Today* would like to apologize for this inaccuracy and for any confusion that we might have caused.

- 5 Reynolds, J.E.F. (ed.) (1982) *Martindale, The Extra Pharmacopoeia*. (28th edn), p.1779, The Pharmaceutical Press

PII: S1359-6446(02)02244-4

Table 1. Active components of Fisherman's Friends Lozenges [5]

Ingredient	Extra	Aniseed
	strong original (% w/w)	flavour (% w/w)
Menthol	0.9	0.5
Eucalyptus oil	0.153	
Cubeb oil	0.305	
Anise oil		0.17
Tincture of capsicum	0.02	
Extract of liquorice	7.317	
Liquorice powder		7.6