

# Ready to respond to the challenges ahead

The Royal Pharmaceutical Society's Welsh Executive is now in a strong position to respond to the challenges ahead, executive chairman Andrea Robinson told the 26th annual general meeting for members in Wales, held at Techniquet, Cardiff Bay, on 10 July. Challenges include the pharmacy plan for Wales, which was expected shortly, and the Society's modernisation programme, which still had much to do.

Activity was accelerating following the appointments of the new secretary to the executive, Cath O'Brien, and her personal assistant, Lisa L'homme. In addition, a freelance journalist, Julie Moar, was working for the executive for two days a month. A former member of staff of the Society's public relations unit, she had been developing coverage of Welsh issues in the national pharmacy press and more recently in the local press.

Giving the annual report for 2001, Mrs Robinson said that at the start of 2001 the executive had submitted a request for a modest increase in its budget. However,



Left to right, Cath O'Brien, Hans Junginger, Andrea Robinson and Colin Hitchings

because the Council had had to impose budget cuts throughout the Society, the Welsh executive budget for 2001 was some £30,000 less than requested and some £2,800 less than for 2000. In the event, the budget had been underspent, partly because of the relative lack of activity, the resignations of the former secretary to the executive (Erica Barrie) and her assistant, and the temporary closure of the office in Cardiff for some six weeks.

During the year, a number of members of the National Assembly for Wales had been approached with regard to a conducted tour of a pharmacy and a number of such visits took place. The visits had varied considerably and were tailored to the requests and interests of the Assembly Members involved.

It had been agreed in 2001 to hold the January executive meeting outside Cardiff to make the executive more visible, and this year's January meeting had been held in North Wales, with a reception on the previous evening for local pharmacists and opinion formers, including guests from the trusts, health authority and local health groups.

Concluding, Mrs Robinson said that the executive had worked effectively as a team, particularly during the weeks when the office in Cardiff was closed. She thanked the members of the executive and also Colin Hitchings, who had stepped in as acting secretary on an interim basis after Mrs Barrie's resignation. His vast experience of pharmacy issues in Britain and overseas had been of significant value to the executive.

## How "sticky and fluffy stuff" helps protein drug delivery

The use of "sticky and fluffy stuff" to aid the absorption of peptides and proteins from the gut was described to the Welsh AGM by Professor Hans E. Junginger (head of the department for pharmaceutical technology at the Leiden/ Amsterdam centre for drug research and scientific secretary to the International Pharmaceutical Federation).

Giving the annual Welsh Executive lecture, Professor Junginger said that the safe and reliable absorption of peptides and proteins was one of the major challenges in oral drug delivery, and the development of suitable systems could not keep pace with the availability of therapeutic agents. These hydrophilic macromolecules were too large, too labile and too polar for straightforward administration by the oral route. They had to face the defence mechanisms of the mucous blanket, intestinal enzymes and lipophilic barrier, which excluded and degraded foreign proteins.

One approach to the problem was to develop delivery systems that employed functional excipients to overcome these barriers by locally modifying intestinal conditions. The concept was to stick the delivery system to the mucosa, ensuring localised release of excipient and drug. By limiting the area over which conditions needed to be modified, this approach reduced excipient requirements and reduced the risks associated with disrupting the defence mechanisms.

Professor Junginger described research on delivery systems using polyacrylic acid

derivatives, polycarbophil and carbomer. These mucoadhesive hydrogels increased permeability by opening the tight junctions between epithelial cells — through their affinity for calcium ions. They also inhibited proteolytic activity, primarily that of trypsin. Effective blood levels, but only 2 per cent absorption, of busserelin had been achieved in rats with 0.5 per cent carbomer.

Better results were expected for chitosan derivatives. Chitosan was adhesive, it deactivated the important enzymes and it bound calcium ions, increasing the concentration gradient and opening the tight junctions. It had many advantages, being biocompatible, biodegradable and available in a range of molecular weights. It was a cheap, plentiful waste product from shells.

A 25 per cent absorption of a 10mg octreotide dose had been achieved using 10 per cent N-trimethyl chitosan chloride (TMC) at pH 7.4 in pigs. This was the wrong pH and impractical, as it was necessary to open the gut and apply the suspension.

The principle of using functional excipients had been established but achieving direct contact with the mucosa remained a problem. The solution was oral administration of novel delivery systems based on superporous hydrogels with a double phase time-controlled release profile. Superporous hydrogels rapidly swelled in water; polymerisation with simultaneous carbon dioxide production achieved a porous structure and a 200-fold expansion. The aim was to

clog the intestine for a few hours, bringing gel surface into contact with the mucosa at a sufficient pressure for successful localised modification of conditions.

Enteric coating delayed the release of enhancers and enzyme inhibitors and then swelling provided a time lag before a burst release of the drug. Drug microparticles were retained by a soluble plug within the superporous hydrogel outer layer or drug minitables were embedded in the surface of the superporous hydrogel.

Studies with octreotide had confirmed that superporous hydrogels and composites were viable candidates for oral delivery systems. In pigs, a 16 per cent absolute bioavailability had been achieved for octreotide formulated with TMC as a penetration enhancer. The gel became mechanically weaker with time and then disintegrated.

### WALES INDUSTRY GROUP

The lecture was sponsored by the Wales Industry Group, which consists of member companies of the Association of the British Pharmaceutical Industry that operate in Wales. Peter Harsant (WIG) told the meeting that WIG had been created in response to devolution and the emergence of a distinct health policy agenda in Wales.

WIG had established dialogue with national bodies in Wales, and had produced an information database on what industry is doing for Wales.