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## Effect of polyethylene glycol 4000 in a thermosensitive and bioadhesive gel for postoperative pain treatment

**Diana Arbelaez-Camargo, Isaac Nofrerias, Marc Suñe, Josep Suñe-Negre, Expert; Encarna García-Montoya and Pilar Pérez-Lozano**  
University of Barcelona, Spain

During the first 24 – 48 hours after an abdominal surgery, the continuous administration of local anaesthetics (LA) and concomitants in the optimal anatomical space, minimizes the systemic side effects and improves postoperative pain management. With this aim, a thermosensitive gel was formulated using poloxamer 407 (P407) as the main polymer with a concentration of 12.5%; hydroxypropylmethylcellulose (HPMC) as bioadhesive agent and polyvinylpyrrolidone (PVP) to modify and adjust the gelation temperature. As active pharmaceutical ingredients, lidocaine hydrochloride (LC) and dexamethasone sodium phosphate (DSP) were used for their synergistic analgesic effect and set at 2% and 0.4% respectively. Polyethylene glycol 4000 (PEG 4000) was added to improve the bioadhesive profile of the formulation due to the physiological characteristics of the peritoneum and other non-mucosal tissues. The addition of PEG 4000 to the formulation, caused a change in the thermosensitive character of the gel, therefore, no gelation was observed when increasing the temperature. At the same time, there was a decrease in the viscosity when increasing the temperature (p-value) and the PEG 4000 concentration (p-value), results that confirmed a change in the properties of the gel. As security parameters to prevent local irritation, pain or endothelial damage, osmolality and pH were studied. Osmolality was affected by the addition of PEG 4000 (p-value) but did not exceed the expected values ( $\leq 400$  mOsm/Kg), in the other hand, the pH was not affected by PEG 4000 (p-value), it remained between acceptable values that provide API's stability.

### Biography

Diana Arbelaez-Camargo is a second year PhD student with one publication in the *International Journal of Pharmaceutics* and an accepted poster presentation at the 10th World Meeting on Pharmaceutics, Biopharmaceutics and Pharmaceutical Technology of Glasgow on 5th of April, 2016 in the controlled drug delivery session. She is also working as Pharmaceutical Development Technician in OPKO Lab Europe, S.L.

[diancayolina@gmail.com](mailto:diancayolina@gmail.com)

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