

Supporting information:**Pharmacological Properties of Bivalent Ligands Containing Butorphan Linked to Nalbuphine, Naltrexone and Naloxone at *Mu*, *Delta* and *Kappa* Opioid Receptors**

Xuemei Peng, Brian I. Knapp, Jean M. Bidlack, John L. Neumeyer

Alcohol and Drug Abuse Research Center, McLean Hospital, Harvard Medical School,
115 Mill Street, Belmont, Massachusetts 02478 and Department of Pharmacology and
Physiology, University of Rochester, School of Medicine and Dentistry,
Rochester, New York 14642

Elemental Analyses:

| Compounds | Formula | | C | H | N |
|--------------------|--|--------------|----------|----------|----------|
| 6 (MCL 436) | C ₅₂ H ₇₀ N ₂ O ₇ · 0.5H ₂ O | Calcd | 73.99 | 8.48 | 3.32 |
| | | Found | 74.18 | 8.31 | 3.57 |
| 7 (MCL 452) | C ₅₁ H ₆₆ N ₂ O ₇ · 1.5H ₂ O · 2HCl | Calcd | 66.65 | 7.79 | 3.05 |
| | | Found | 66.92 | 7.97 | 3.29 |
| 8 (MCL 456) | C ₅₀ H ₆₄ N ₂ O ₇ · 2H ₂ O | Calcd | 71.40 | 8.15 | 3.33 |
| | | Found | 71.13 | 8.01 | 3.59 |