Non pungent TRPV1 agonist as topical analgesics for neuropathic pain

Medifron_DBT

Contact Information

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Industry Sector	Drug discovery, Pharmaceutical
Therapeutic Area	Central Nervous System, Dermatological etc.
Stage of Development	Preclinical

1. Summary

- TRPV1 is non selective ion channel with a preference for Ca2+.
- TRPV1 function as neuronal membrane recognition site for proton, heat, and irritant compounds such as capsaicin (CAP), resiniferatoxin (RTX).
- TRPV1 expressed exclusively by primary sensory neurons involved in nociception and neurogenic inflammation
- By TRPV1 functional modulation, neuropathic pain can be controlled.
- MDFR series compounds from Medifron_DBT have broad range analgesic effect on inflammatory pain through neuropathic pain.
- Also, those compounds showed very low pungency profile.
- It can be developed topical cream and gel formulation of TRPV1 agonist.
- The possible applications are Post Herpetic Neuralgia (PHN), Diabetic Peripheral Neuropathy (DPN) and Chemotherapy Induced Neuropathic Pain (CINP) etc.

2. Applications

- Applicable to broad range analgesics on inflammatory pain through neuropathic pain.
- Topical cream and gel formulation possible.
- Intervention area : Post Herpetic Neuralgia (PHN), Diabetic Peripheral Neuropathy (DPN), post operational pain and Chemotherapy Induced Neuropathic Pain (CINP)

3. Market Feasibility

- Pain market size is huge over 100B US$
- Neuropathic pain market is around 4B US$
- Topical analgesics make 1B US$ market
- Novel analgesics for neuropathic pain can expend market size

4. Type of Business Relationship Sought (include licensing availability)

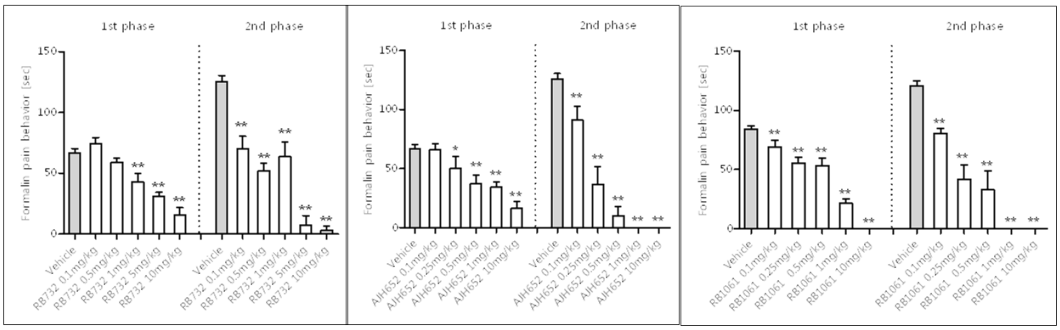
- This program is currently at formulation study for topical administration
- Need to collaboration with pain expert global company for formulation
- We are seeking partner who are able to collaborate in GLP compliant toxicology study and IND enabling studies together with FTE based collaboration.
- Out licensing deals for world exclusive sales right except Korea
- Licensing deals should along with collaboration

5. Technical Advantages

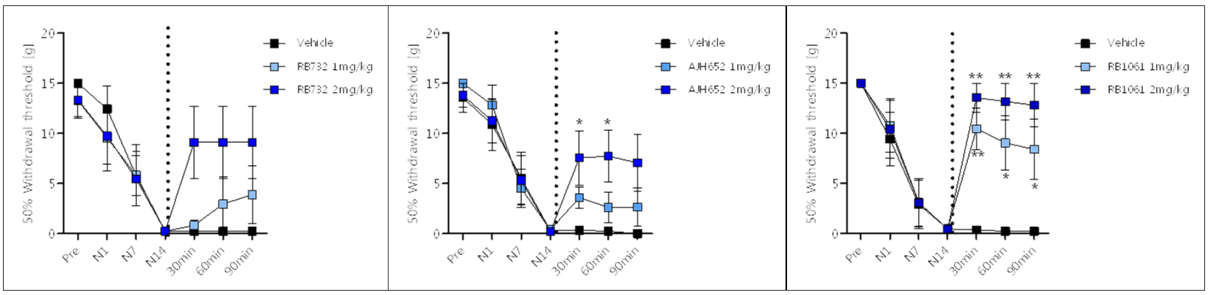
- Non of TRPV1 antagonist come out market place
- Several TRPV1 agonist already existed such as capsaicin cream/ patch, zucapsaicin cream
- Capsaicin patch has strong pungency profile. Patient should use Lidocaine as anesthetic before using capsaicin patch, it's very uncomfortable and high cost medicine
- MDFR series compounds showed non pungent and excellent effective topical treatment for neuropathic pain and inflammatory pain
- Broad application of non pungent TRPV1 agonist expected

6. Technical Highlighted Summary

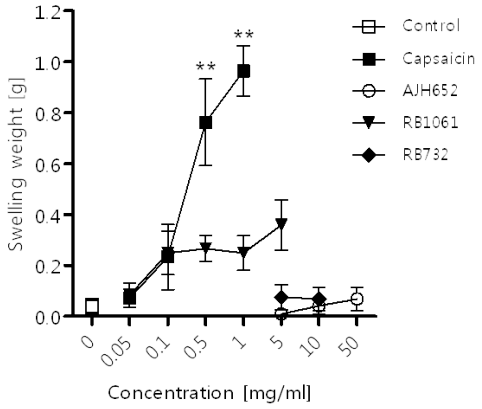
- Less than 2mg/kg dosing, full efficacy showed in formalin test and neuropathic pain model test
- MDFR series compounds did not causing any irritation and edema in mice ear
- MDFR compounds are very much safer than capsaicin

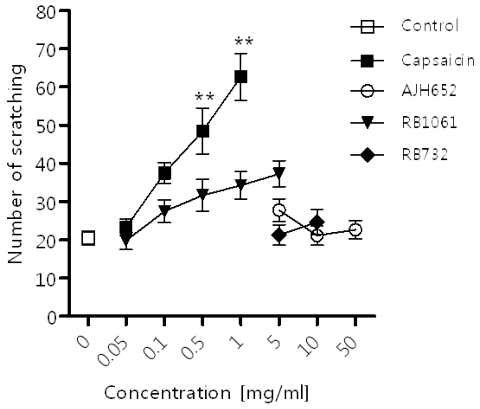


ED50 for formalin test = 0.1 ~ 2 mg/kg



ED50 for Chung's model = 0.5 ~ 2 mg/kg





- No [weak] irritation & No [weak] edema

7. Mechanism (MOA)

- TRPV1 partial agonist
- Agonism mediated pain signal blocking

8. Patent Information and Status

- Grunenthal and Medifron_DBT co-developed the most of TRPV1 agonist and antagonist
- Medifron_DBT has right for TRPV1 agonist (over 60% agonism)
- Grunenthal filed recent patents including Medifron_DBT compounds

9. Patent Number(s)

Internal No.	Country	Application No.	Filing Date	Title	Inventors
GRA 3678-EP	EP	14003950.4	24.11.2014	Substituted oxazole- and thiazole-based carboxamide and urea derivatives as vanilloid receptor ligands I	Frormann, Sven; Stockhausen, Hannelore; Schiene, Klaus; Saunders, Derek John; Christoph, Thomas; Frank-Foltyn, Robert; Habermann, Christopher; Lesch, Bernhard; Bahrenberg, Gregor; Damann, Nils; Lee, Jeewoo
GRA 3679-EP	EP	14003949.6	24.11.2014	Substituted oxazole- and thiazole-based carboxamide and urea derivatives as vanilloid receptor ligands II	Frormann, Sven; Stockhausen, Hannelore; Schiene, Klaus; Saunders, Derek John; Christoph, Thomas; Frank-Foltyn, Robert; Habermann, Christopher; Lesch, Bernhard; Bahrenberg, Gregor; Damann, Nils; Lee, Jeewoo

10. Key Words

- TRPV1, agonist, non pungent, topical analgesic, Post Herpetic Neuralgia (PHN), Diabetic Peripheral Neuropathy (DPN), post operational pain and Chemotherapy Induced Neuropathic Pain (CINP)

11. Company Description

- In 1999, the company spun off from Seoul National University, School of Medicine and School of Pharmacy in order to commercialize intellectual property and asset of academia for Alzheimer's disease and neuropathic pain.
- In 2002, Korean Government nominated the company as NATIONAL CENTER for Alzheimer's Disease DRUG DEVELOPMENT
- Medifron_DBT and Grunenthal GmbH, Germany based pharmaceutical company made a license and research collaboration agreement on TRPV1 antagonists, so called target based license in year 2005 and 2007 additional licensing deal made
- In 2008, Medifron_DBT and Daewoong pharmaceutical company made an agreement for Alzheimer drug co-development
- In 2010, Swiss based pharmaceutical company Roche and Medifron_DBT, Inc. have entered into an agreement of Research Collaboration and License on RAGE antagonists for Alzheimer's disease treatment.