

## BIOGRAPHICAL SKETCH

NAME Sperlágh, Beáta	POSITION TITLE Deputy director, Head of Department, Scientific Advisor, Professor of Pharmacology
GENDER Female, married, 2 children	
<i>Date of Birth:</i> February 24, 1963	<i>Place of Birth:</i> Budapest, Hungary
<i>Citizenship:</i> Hungarian	<i>Current Address:</i> Institute of Experimental Medicine, Hungarian Academy of Sciences, H-1083 Budapest, Szigony u. 43., Hungary

EDUCATION/TRAINING			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Semmelweis University, Budapest, Hungary	MD	1987	Medicine
Hungarian Academy of Sciences, Budapest, Hungary	PhD	1995	Neuroscience
Ministry of Health, Budapest, Hungary	Board certificate	2000	Clinical pharmacology
Hungarian Academy of Sciences, Budapest, Hungary	DSc	2004	Neuroscience
Semmelweis University, Budapest, Hungary	Med. Habil.	2008	Pharmacology
Semmelweis University, Budapest, Hungary	Professor	2009	Pharmacology

### Present positions:

2002-	Deputy director, Institute of Experimental Medicine, Hungarian Academy of Sciences
2002-	Head of Laboratory of Molecular Pharmacology, Inst. of Experimental Medicine, Hungarian Academy of Sciences
2004-	scientific advisor, Institute of Experimental Medicine, Hungarian Academy of Sciences
2012-	Head of Department of Pharmacology, Institute of Experimental Medicine, Hungarian Academy of Sciences

### Past Professional Appointments:

1988 -1994	Assistant research fellow in the Department of Pharmacology, Institute of Experimental Medicine, Hungarian Academy of Sciences
1995 - 2002	Associate research fellow, Department of Pharmacology, Inst. of Experimental Medicine, Hungarian Academy of Sciences
1995 - 2002	Head of Neurochemical Research Group, Department of Pharmacology, Inst. of Experimental Medicine, Hungarian Academy of Sciences
1998 - 2001	Deputy head of Department of Pharmacology, Inst. of Experimental Medicine, Hungarian Academy of Sciences

**Fellowships:**

- 1992: IBRO-McArthur Fellowship  
2000-2003 Széchenyi Professor Fellowship

**Study trips:**

- 1990 : study trip of the Royal Society in London at Prof. Geoffrey Burnstock  
1991: visiting researcher in the Center of Neurochemistry in Orangeburg, New York  
1992: visiting researcher in the Center of Neurochemistry a in Orangeburg, New York  
1996: visiting researcher in the Center of Neurochemistry, Orangeburg, New York  
2005: study trip of Royal Society at prof. Nicholas Dale in the University of Warwick

**Fields of interest:**

Neuropharmacology; Purinergic signalling in the central nervous system under physiological and pathological conditions  
Neurochemistry and pharmacology of cannabinoids in the central nervous system  
Neurodegeneration and psychiatric disorders

**Editorial Activities***Editorial Board memberships:*

- 2003-2007: Journal of Pharmacological Sciences  
2003- Purinergic Signalling,  
2007- Neurochemical Research  
2014- Neurochemistry International  
2009- Inflammopharmacology, Section Editor  
2009- British Journal of Pharmacology, Handling Editor receiving approx. 15-20 manuscript/year (IF:4.842)  
2007: Guest Editor of special issue of Neurochemistry International entitled 'Non-synaptic transmission' (IF: 3.092)  
2015- Guest Editor of special issue of Neuropharmacology entitled 'Purines in Neurodegeneration and Neuroregeneration' (If: 5.11)  
2015- Associate Editor of Purinergic Signalling, receiving approx. 2-3 manuscript/month (IF:3.886)

Regular reviews to a number of scientific periodicals (e.g. Cerebral Cortex, J. Neuroscience, J. Neurochemistry, International Journal of Neuropsychopharmacology, etc.) International and Hungarian Grant Agencies, (e.g. FWF, FCT, OTKA, Wellcome Trust); evaluator of thesis work and research portfolio at European Universities (e.g. Universidad Complutense de Madrid, Spain, Royal College of Surgeons, Dublin, Ireland, Division of Pharmacology and Toxicology University of Florence, Italy, Pharmacology of University of Milan, Italy)

**Tutorial experience:**

- 1990- lecturer at postgraduate courses in clinical pharmacology

- 1995- supervisor of graduate and PhD students, Neuroscience faculty, Semmelweis University School of PhD studies,
- 1996- lecturer, postgraduate courses for PhD. students, Semmelweis University School of PhD studies, Neuroscience faculty, Budapest
- 1997-2012 lecturer for graduate students at the Institute of Pharmacology and Pharmacotherapy, Semmelweis Medical University, Budapest
- 2006-2010 lecturer and head of postgraduate courses in Neuropharmacology in the Faculty of Drug Research and Development co-organised by the Technical University Budapest and Semmelweis University, Budapest
- 2010- lecturer, postgraduate courses teaching Pharmacodynamics for PhD. students, Doctoral School of Pharmaceutical Sciences, Semmelweis University School of PhD Studies, Budapest

**Professional Activities:**

- 1996-1999 Elected member of the Board of Directors of Institute of Experimental Medicine
- 1996-2013 member of Pharmacotherapy and Drug Abuse Committee of Hungarian Medical Research Council
- 1997- member of Basic Medical Science Committee of the Department of Medical Sciences, Hungarian Academy of Sciences
- 1998- Council member, Hungarian Society of Experimental and Clinical Pharmacology
- 2002- Deputy chairman, Scientific Council of the Institute of Experimental Medicine, Hungarian Academy of Sciences
- 2004-2014 Secretary, Experimental Section of the Hungarian Society of Experimental and Clinical Pharmacology
- 2006- member of Presidium of the Section of Drug Biochemistry of the Hungarian Society of Biochemistry
- 2006- Member of the Evaluation Committee of D.Sc. applications, Department of Medical Sciences, Hungarian Academy of Sciences
- 2007-2010 member of the Advisory Board of Bólyai Fellowship
- 2008-2011 member of the Advisory Board of the Homeland Research Program of the Hungarian Academy of Sciences
- 2008- member of the Advisory Board of the Conference Award for young scientists of Hungarian Academy of Sciences
- 2008-2015 member of the Life Science Advisory Board of the Council of Research Units of Hungarian Academy of Sciences
- 2010-2013 member of the Life Science College of Bólyai fellowship

2011-2013	member of the Experimental Medicine jury of the Hungarian National Science Foundation
2014:	Secretary General, Experimental Section of the Hungarian Society of Experimental and Clinical Pharmacology
2014-	President, Experimental Section of the Hungarian Society of Experimental and Clinical Pharmacology
2014-	Council member of Federation of the European Pharmacological Societies (EPHAR)
2014-	Council member of International Union of Basic and Clinical Pharmacology (IUPHAR)

### **Membership of Scientific Societies:**

Hungarian Society of Experimental and Clinical Pharmacology

Hungarian Society of Neuroscience

European Society of Neurochemistry

Federation of European Societies of Neuroscience

International Society of Neurochemistry

Arbeitskreis für Neuropharmakologie und Toxikologie

International Purine Club

Society for Neuroscience

Federation of the European Pharmacological Societies (EPHAR)

International Union of Basic and Clinical Pharmacology (IUPHAR)

### **Ongoing Research Support**

PI and Co-PI receiving grants from Hungarian National Research Foundation, Hungarian Research and Technology Office, Hungarian Brain Research Program, European Research Council

### **Ongoing International Collaborations**

- Rudolf Boehm Institute für Pharmakologie und Toxikologie, Leipzig, Germany
- Ludwig-Maximilians-Universität Munich, Munich (Germany)
- Department of Pharmacology and Toxicology, University of Bonn, Bonn, (Germany)
- PharmaCenter Bonn, Pharmaceutical Institute, University of Bonn, Bonn (Germany)
- Institute of Chemical and Engineering Sciences, A\*STAR, Singapore (Singapore)
- Department of Pharmacological and Biomolecular Sciences, Università degli Studi di Milano, Milan (Italy)
- Department of Biomedical Sciences, University of Cagliari, Cagliari, (Italy)
- Inflammation and Experimental Surgery Research Unit, Murcia Biomedical Research Institute (IMIB), Murcia, (Spain)
- Achucarro Basque Center for Neuroscience, Ikerbasque, the Basque Foundation for Science, University of the Basque Country EHU/UPV, Bizkaia, (Spain)
- Janssen Research & Development, LLC., Neuroscience TA, San Diego, CA, (USA)

- Department of Chemistry, American University, Washington, DC, (USA)

### **Awards:**

1993: Academy Award of the Hungarian Academy of Sciences for Young Scientists  
1995: First prize of the Hungarian Society of Experimental and Clinical Pharmacology for Young Scientists  
1998: Research Award of SIGMA Chemical Co.  
1998: Research Award of the TEVA-BIOGAL Pharmaceutical Company  
2005: L'Oreal-UNESCO Scientific award for Women in Science  
2007: Charles Simonyi Research Award  
2010: Dénes Gábor Award

### **Symposium Organisation**

2004: "Function of pre- and postsynaptic P2 receptors in the normal and pathological nervous system", symposium of the 4th EPHAR Congress, Porto, 2004, July 14-17, organiser  
2005: The first symposium of the Hungarian Experimental Pharmacology, Budapest, 2005. June 6-7, organiser  
2006: "Adrenergic transmission: from benchside to bedside", international symposium, Visegrád, 2006. October 6-7, organiser  
2007: "Non-synaptic transmission", international symposium, Hungarian Academy of Sciences, Budapest, 2007 March 20, organiser  
2009: XII. conference of the Hungarian Society of Neuroscience, member of organizing Committee  
2009: „Influence of degeneration and repair in the CNS and periphery”, International workshop, organiser  
2009: „Purines 2010” international meeting, member of International Advisory Board  
2012: "International Conference to celebrate the 50<sup>th</sup> Anniversary of the Hungarian Society for Experimental and Clinical Pharmacology", organizer  
2014: co-chair of 8th International Symposium on Cell/Tissue Injury and Cytoprotection/Organoprotection, Budapest, Hungary  
2015: Member of the Scientific Committee of the 3rd Conference of the European Society of Pharmacogenomics and Personalized Therapy, October 7-9, 2015  
2015: Member of International Scientific Advisory Board of EPHAR2016, (7th European Congress of Pharmacology), 26-30 June, 2016, Istanbul, Turkey

### **Scientometric Record**

379 publications, 90 full papers in international peer reviewed journals, 9 chapters, cc. 280 abstracts  
Impact factor: **317**, Citations (Web of Science/Scopus): **3855**, H-index: **32**

## List of publication (full papers, in chronological order).

- [1] E. Milusheva, B. Sperlagh, B. Kiss, L. Szporny, E. Pasztor, M. Papisova and E.S. Vizi (1990) Inhibitory effect of hypoxic condition on acetylcholine release is partly due to the effect of adenosine released from the tissue. *Brain Res. Bull.* 24:369-373.
- [2] E.S. Vizi, B. Sperlagh and A. Lajtha (1990) Evidence for a presynaptic P2x purinoceptor involved in facilitation of acetylcholine release. *Annals of the N.Y. Acad. of Sci.* 603:500-502.
- [3] B. Sperlagh and E.S. Vizi (1991) Effect of presynaptic P2 receptor stimulation on transmitter release. *J. Neurochem.* 56:1466-1470.
- [4] E.S. Vizi, B. Sperlagh and M. Baranyi (1992) Evidence that ATP, released from the postsynaptic site by noradrenaline, is involved in mechanical responses of guinea-pig vas deferens: cascade transmission. *Neuroscience* 50(2):455-465.
- [5] B. Sperlagh and E.S. Vizi (1992) Is the neuronal ATP release from guinea-pig vas deferens subject to  $\square$ 2-adrenoceptor-mediated modulation? *Neuroscience* 51(1):203-209.
- [6] O. Nagano, F.F. Foldes, H. Nakatsuka, D. Reich, Y. Ohta, B. Sperlagh and E.S. Vizi (1992) Presynaptic A1-purinoceptor-mediated inhibitory effects of adenosine and its stable analogues on the mouse hemidiaphragm preparation. *Naunyn-Schmiedeberg's Arch. Pharmacol.* 346:197-202.
- [7] B. Sperlagh, A. Kittel, A. Lajtha and E.S. Vizi (1995) ATP acts as fast neurotransmitter in rat habenula: neurochemical and enzyme cytochemical evidence. *Neuroscience* 66: 915-920.
- [8] B. Sperlagh, E.S. Vizi (1996) Neuronal synthesis, storage and release of ATP. *Seminars in the Neurosciences* 8:175-186.
- [9] Z. Juranyi, E. Orso, A. Janossy, K.Sz. Szalay, B. Sperlagh, K. Windisch, G.P. Vinson and E.S. Vizi (1997). ATP and [3H]noradrenaline release and the presence of ectoATPases in the capsule-glomerulosa fraction of the rat adrenal gland. *J. Endocrinol.* 153:105-114.
- [10] B. Sperlagh, I. Andras, E.S. Vizi, (1997) Effect of subtype-specific Ca<sup>2+</sup> antagonists and Ca<sup>2+</sup>-free media on the field stimulation evoked release of ATP and [3H]acetylcholine from rat habenula slices. *Neurochem. Res.* 22: 967-975.
- [11] E.S. Vizi, S.D. Liang, B. Sperlagh, . Kittel, Zs. Juranyi (1997) Studies on the release and extracellular metabolism of endogenous ATP in rat superior cervical ganglion: support for neurotransmitter role of ATP. *Neuroscience* 79: 893-903.
- [12] B. Sperlagh, G. Zsilla, M. Baranyi, A. Kekes -Szabo and E.S. Vizi (1997) Age-dependent changes of presynaptic neuromodulation via A1-adenosine receptors in rat hippocampal slice. *Int. J. Devl. Neuroscience* 15:739-747.
- [13] B. Sperlagh, H. Sershen, A. Lajtha and E.S. Vizi (1998) Co-release of endogenous ATP and [3H]noradrenaline from rat hypothalamic slices: origin and modulation by  $\square$ 2-adrenoceptors. *Neuroscience* 82:511-520.
- [14] B. Sperlagh, Zs. Magloczky, E.S. Vizi and T.F. Freund (1998) The triangular septal nucleus as the major source of ATP release in the rat habenula: a combined neurochemical and morphological study. *Neuroscience* 86:1195-1207.
- [15] B. Sperlagh, G. Hasko, Z.H. Nemeth and E.S. Vizi (1998) ATP released by lipopolysaccharide increases nitric oxide production in RAW 264.7 macrophages via P2Z/P2X7 receptors. *Neurochem. Int.* 33:209-215.
- [16] Sperlagh B, Mergl Z, Juranyi Z, Vizi ES, Makara GB (1999) Local regulation of vasopressin and oxytocin secretion by extracellular ATP in the isolated posterior lobe of the rat hypophysis. *J Endocrinol* 160:343-350.
- [17] Z Juranyi, B Sperlagh, ES Vizi (1999) Involvement of P2 purinoceptors and the nitric oxide pathway in [3H]purine outflow evoked by short-term hypoxia and hypoglycemia in rat hippocampal slices. *Brain Res* 823:183-190.
- [18] E.S. Vizi, B Sperlagh (1999) Receptor- and carrier-mediated release of ATP of postsynaptic origin: cascade transmission. *Progr in Brain Res* 120:160-169.
- [19] K. Oe, B. Sperlagh, E. Santha, I. Matko, H. Nagashima, late F. F. Foldes, and E. S. Vizi (1999) Modulation of norepinephrine release by ATP-Dependent K<sup>+</sup>-Channel activators and inhibitors in Guinea-Pig and human isolated right Atrium. *Cardiovasc. Res.* 43:125-134.
- [20] E. S. Vizi and B. Sperlagh (1999) Separation of carrier mediated and vesicular release of GABA from rat brain slices. *Neurochem Int.* 34:407-413.
- [21] Katona, I. B. Sperlagh, A. Sik, A.Kofalvi, E. S.Vizi, K. Mackie and T. F. Freund (1999) Presynaptically located CB1 cannabinoid receptors regulate GABA release from axon

- terminals of specific hippocampal interneurons. *The Journal of Neuroscience* 19:4544-4558.
- [22] E. S. Vizi, K. Nitahara, K. Sato and B. Sperlách (2000) Stimulation-dependent release, breakdown, and action of endogenous ATP in mouse hemidiaphragm preparation: the possible role of ATP in neuromuscular transmission. *J. Auton Nerv. Syst* 81:278-284.
- [23] E. Sántha, B. Sperlách, T. Zelles, G. Zsilla P.T. Tóth, B. Lendvai, M. Baranyi and E. S. Vizi (2000) Multiple cellular mechanisms mediate the effect of lobeline on the release of norepinephrine. *Journal of Pharmacology and Experimental Therapeutics*. 294:302-307.
- [24] Kőfalvi, A. B. Sperlách, T. Zelles and E. S. Vizi (2000) Long-lasting facilitation of [3H]GABA release from rat hippocampal slices by nicotinic receptor activation. *Journal of Pharmacology and Experimental Therapeutics* 295:453-62.
- [25] Katona, I., B. Sperlách, Z. Maglóczy, E. Sántha, A. Kőfalvi, S. Czirják, K. Mackie, E.S. Vizi and T.F. Freund (2000) GABAergic interneurons are the target of cannabinoid actions in the human hippocampus. *Neuroscience* 100:797-804.
- [26] B. Sperlách, M. Dóda, M. Baranyi and G. Haskó. (2000) Ischemic condition releases norepinephrine and purines from different sources in superfused rat spleen strips. *J. Neuroimmunol.* 111:45-54.
- [27] B. Sperlách, F. Erdélyi, G. Szabó, and E. S. Vizi (2000) Local regulation of [3H]noradrenaline release from the isolated guinea-pig right atrium by P2x- receptors located on axon terminals. *Br. J. Pharmacol.* 131:1775-1783.
- [28] B. Sperlách, G. Zsilla and E.S. Vizi (2001) KATP channel blockers selectively interact with A1-adenosine receptor mediated modulation of acetylcholine release in the rat hippocampus. *Brain Res* 889:63-70.
- [29] B. Sperlách, P. Illés, Z. Gerevich and A. Kőfalvi, (2001) Distinct mechanisms underlying  $\alpha$ 1- and P2x receptor operated ATP release and contraction in the guinea-pig vas deferens *Neurochem. Res.* 26:951-957.
- [30] Vizi, E.S., Gy Haskó, B Lendvai and B Sperlách (2001) Role of endogenous ATP in the regulation of pro- and anti-inflammatory mediator production. *Drug Dev Res* 53:117-125.
- [31] B. Sperlách, A. Kőfalvi, J. Deuchars, L. Atkinson, C. Milligan, N. J. Buckley, and E. S. Vizi (2002) Involvement of P2X7 receptors in the regulation of neurotransmitter release in the rat hippocampus. *J. Neurochem.* 81:1196-1211.
- [32] A. Brassai, K. Makó, L. Domjanschitz and B. Sperlách, (2002) Lack of prejunctional modulation of noradrenaline release by endogenous nitric oxide in guinea-pig pulmonary artery. *Neurochem. Int.* 41:279-283.
- [33] J. Luthardt, J. Sebestyén, J. Borvendég, B. Sperlách, and P. Illés (2002) P2Y receptor activation inhibits NMDA receptor-channels in layer V pyramidal neurons of the rat prefrontal and parietal cortex. *Neurochemistry Int.* 1238:1-12.
- [34] B. Sperlách, G. Szabó, F. Erdélyi, M. Baranyi and E. S. Vizi (2003) Homo- and heteroexchange of adenine nucleotides and nucleosides in rat hippocampal slices by the nucleoside transport system. *Br. J. Pharmacol.* 139:623-633.
- [35] E. Milusheva, B. Sperlách, L. Shikova, M. Baranyi, L. Tretter, V. Ádám-Vizi and E. S. Vizi, (2003) Non-synaptic release of [3H]noradrenaline in response to oxidative stress combined with mitochondrial dysfunction in rat hippocampal slices. *Neuroscience* 120:771-781.
- [36] A. Kőfalvi, E. S. Vizi, C. Ledent and B. Sperlách, (2003) Cannabinoids inhibit the release of [3H]glutamate from rodent hippocampal synaptosomes via a novel, CB1 receptor-independent action. *European Journal of Neuroscience* 18:1973-8.
- [37] Németh ZH, Leibovich SJ, Deitch EA, Sperlách B, Virag L, Vizi ES, Szabo C, Haskó G. (2003) Adenosine stimulates CREB activation in macrophages via a p38 MAPK-mediated mechanism. *Biochem Biophys Res Commun.* 312:883-8.
- [38] K. Kordás, B. Sperlách, T. Tihanyi, L. Topa, M. C. Steward, G. Varga, and Á. Kittel, (2004) ATP and ATPase secretion in the exocrine pancreas in rat, guinea-pig and man. *Pancreas* 29:53-60.
- [39] B. Sperlách, M. Baranyi, G. Haskó, and E. S. Vizi, (2004) Potent action of interleukin-1 $\beta$  to evoke ATP and adenosine release from rat hippocampal slices. *J. Neuroimmunol* 151:33-39.
- [40] Papp L, Balázsa T, Kőfalvi A, Erdélyi F, Szabó G, Vizi ES, and B. Sperlách (2004) P2X receptor activation elicits transporter-mediated noradrenaline release from rat hippocampal slices. *J Pharmacol Exp Ther.* 310: 973-80.
- [41] L. Papp, E. S. Vizi, and B. Sperlách, (2004) Lack of ATP-evoked GABA and glutamate release in the hippocampus of P2X7 receptor -/- mice. *Neuroreport* 15:2387-2391.

- [42] A. Kőfalvi, R.J. Rodrigues, C. Ledent, K. Mackie, E.S. Vizi, R.A. Cunha and B. Sperlág (2005) Involvement of cannabinoid receptors in the regulation of neurotransmitter release in the rodent striatum: A combined immunochemical and pharmacological analysis. *J Neurosci.* 25: 2874-2884.
- [43] E. Milusheva, M. Baranyi, Á. Kittel, B. Sperlág and E. S. Vizi (2005) Increased sensitivity of striatal dopamine release to H<sub>2</sub>O<sub>2</sub> upon chronic rotenone treatment. *Free Radical Biology and Medicine* 39: 133-142.
- [44] Franke H., Klimke K, Brinckmann U., Grosche J., Francke M., B. Sperlág, A. Reichenbach, Liebert U.G. and Peter Illes (2005) P2X7 receptor expression in the mouse retina: involvement in retinal degeneration of BALB/c mice. *Neurochem Int.* 47:235-42.
- [45] Á. Kittel, A. L. Kiss, N. Müllner, I. Matkó, and B. Sperlág (2005) Expression of NTPDase1 and caveolins in human cardiovascular disease. *Histochem Cell Biol.* 124:53-61.
- [46] E. Milusheva, V.J. Kuneva, D. E. Itzev, N.I. Kortezova, B. Sperlág and N. Z Mizhorkova (2005) Glutamate stimulation of acetylcholine release from myenteric plexus is mediated by endogenous nitric oxide. *Brain Res Bull* 66: 229-34.
- [47] Wirkner K, Kőfalvi A, Fischer W, Günther A, Heike F, Arndt-Gröger H, Nörenberg W, Madarász E, Vizi ES, Schneider D, Sperlág B., Illés P (2005) Supersensitivity of P2X7 receptors in cerebrocortical cell cultures after in vitro ischemia. *J Neurochem* 95:1421-37.
- [48] M. Baranyi, E. Milusheva, E.S. Vizi and B. Sperlág (2006) Chromatographic analysis of dopamine metabolism in a Parkinsonian model. *J. Chromatography A* 1120:13-20.
- [49] B. Sperlág, E. S. Vizi, K. Wirkner and P. Illes (2006) P2X7 receptors in the nervous system. *Progr in Neurobiol* 78:327-346.
- [50] Papp L., Vizi E. S., Sperlág B (2007) P2X7 receptor mediated phosphorylation of p38MAP kinase in the hippocampus. *Biochemical and Biophysical Research Communications* 355:568-574.
- [51] Kittel A, Sperlág B, Pelletier J, Sevigny J, Kirley TL (2007) Transient changes in the localization and activity of ecto-nucleotidases in rat hippocampus following lipopolysaccharide treatment. *Int J Dev Neuroscience* 25:275-82.
- [52] Milius D, Gröger-Arndt H, Stanchev D, Lange-Dohna C, Rossner S, Sperlág B, Wirkner K, Illes P (2007) Oxygen/glucose deprivation increases the integration of recombinant P2X7 receptors into the plasma membrane of HEK293 cells. *Toxicology* 238:60-9.
- [53] Sperlág B, Vizi ES (2007) Extracellular interconversion of nucleotides reveals an ecto-adenylate kinase activity in the rat hippocampus. *Neurochem Res* 32:1978-89.
- [54] Sperlág B, Zsilla G, Baranyi M, Illés P, Vizi ES (2007) Purinergic modulation of glutamate release under ischemic-like conditions in the hippocampus. *Neuroscience* 149:99-111.
- [55] Sperlág B, Heinrich A, Csölle C. (2007) P2 receptor mediated modulation of neurotransmitter release – an update. *Purinergic Signalling* 3:269-284.
- [56] Sperlág B., Illés P. (2007) Purinergic modulation of microglial cell activation. *Purinergic Signaling* 3:117-127.
- [57] Wirkner K, Sperlág B, Illés P. (2007) P2X3 Receptor Involvement in Pain States. *Mol Neurobiol.* 36(2):165-83.
- [58] Heinrich A, Kittel A, Csölle C, Vizi E.S., Sperlág B. (2008) Modulation of neurotransmitter release by P2X and P2Y receptors in the rat spinal cord. *Neuropharmacology* 54(2):375-86.
- [59] Balázsa T, Biró J, Gullai N, Ledent C, Sperlág B. (2008) CB(1)-cannabinoid receptors are involved in the modulation of non-synaptic [3H]serotonin release from the rat hippocampus. *Neurochem Int.* 52(1-2):95-102.
- [60] Milusheva E, Baranyi M, Kittel A, Fekete A, Zelles T, Vizi ES, Sperlág B (2008) Modulation of dopaminergic neurotransmission in rat striatum upon in vitro and in vivo diclofenac treatment. *B. J. Neurochem.* 105:360-8.
- [61] Csölle C, Heinrich A, Kittel A, Sperlág B., (2008) P2Y receptor mediated inhibitory modulation of noradrenaline release in response to electrical field stimulation and ischemic conditions in superfused rat hippocampus slices. *J Neurochem.* 106: 347-360.
- [62] Milius D, Sperlág B, Illés, P. (2008) Up-regulation of P2X(7) receptor-immunoreactivity by in vitro ischemia in the plasma membrane of cultured rat cortical neurons. *Neuroscience Letters* 446: 45-50.
- [63] Dunkel, P, Gelain, A, Barlocco, D, Haider, N, Gyires, K, Sperlág, B, Magyar, K, Maccioni, E, Fadda, A, Mátyus, P. (2008) Semicarbazide-sensitive amine oxidase/vascular adhesion protein 1: Recent developments concerning substrates and inhibitors of a promising therapeutic target. *Current Medicinal Chemistry* 15: 1827-1839.



- [64] Valverde, O., Célérier, E., Baranyi, M., Vanderhaeghen, P., Maldonado, R., Sperlágh, B., Vassart, G., Ledent, C. (2009) GPR3 receptor, a novel actor in the emotional-like responses. *Plos One* 4:e4704.
- [65] Sperlágh B, Windisch K, Andó R.D., Vizi E.S. (2009) Neurochemical evidence that stimulation of CB1 cannabinoid receptors on GABAergic nerve terminals activates the dopaminergic reward system by increasing dopamine release in the rat nucleus accumbens. *Neurochem. Int.* 54:452-457.
- [66] P. Rubini, J. Engelhardt, M. Al-Khrasani, H. Franke, A. Heinrich, B. Sperlágh, J. Milosevic, J. Schwarz, W.O. Nörenberg, and P. Illés (2009) Increase of intracellular Ca<sup>2+</sup> by adenine and uracil nucleotides in human midbrain-derived neuronal progenitor cells. *Cell Calcium* 45:485-98.
- [67] Milusheva E, Baranyi M, Kormos E, Hracskó Z, Sylvester Vizi E, Sperlágh B. (2010) The effect of antiparkinsonian drugs on oxidative stress induced pathological [3H]dopamine efflux after in vitro rotenone exposure in rat striatal slices. *Neuropharmacology.* 58:816-25.
- [68] Csölle C, Sperlágh B. (2010) Peripheral origin of IL-1beta production in the rodent hippocampus under in vivo systemic bacterial lipopolysaccharide (LPS) challenge and its regulation by P2X7 receptors. *J Neuroimmunol.* 219(1-2):38-46.
- [69] Andó R, Méhécz B, Gyires K, Illes P, Sperlágh B. (2010) A comparative analysis of the activity of ligands acting at P2X and P2Y receptor subtypes in models of neuropathic, acute and inflammatory pain. *Br J Pharmacol.* 159(5):1106-17.
- [70] B. Sperlágh and E. S. Vizi (2011) The role of extracellular adenosine in chemical neurotransmission in the hippocampus and basal ganglia: pharmacological and clinical aspects. *Current Topics in Med. Chem.* 11(8):1034-46.
- [71] Csölle C, Sperlágh B. (2011) Endocannabinergic modulation of interleukin-1β in mouse hippocampus under basal conditions and after in vivo systemic lipopolysaccharide stimulation. *Neuroimmunomodulation.* 2011;18(4):226-31.
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