

CURRICULUM VITAE

Prof. Michele Navarra

Position Full professor in Pharmacology at the Department of Chemical, Biological, Pharmaceutical and Environmental Sciences, University of Messina (Italy).
Member of Ethics Committee of Messina.
Member of the Executive Board of the Italian Society of Toxicology (SITOX).

Studies

15/12/1994 Specialization in Pharmacognosy at the University of Messina (Italy), with the highest marks.

12/11/1990 Degree in Pharmacy at the University of Messina (Italy), summa cum laude.

Professional experiences

From January 2020 Full professor of Pharmacology, Clinical Pharmacology and Pharmacognosy at the University of Messina (Italy).

2006 - 2019 Associate professor of Pharmacology at the University of Messina (Italy).

1996 - 2006 Assistant professor of Pharmacology at the Faculty of Pharmacy of the University "Magna Græcia" of Catanzaro (Italy).

1999 - 2002 Visiting researcher at the Laboratory of Biochemistry and Molecular Biology, Institute of Biotechnology and Biomedicine "Vicent Villar i Palasi", Universitat Autònoma de Barcelona (Spain).

1994 - 1996 Visiting researcher at the Department of Experimental Medicine and Biochemical Sciences, University of Rome "Tor Vergata" (Italy).

1991 - 1993 Member of a research group at the Pharmaco-Biological Department, University of Messina (Italy).

Awards and Fellowships

25/7/2015 "Ellade" prize for scientific research.

2002 Fellowship by Consejo Superior de Investigaciones Científicas (CSIC, Spain).

2001 Fellowship by the Italian Society of Toxicology (SITOX).

2000 Fellowship for "Short Term Mobility" awarded by the National Research Council (CNR, Italy).

08/10/1999 "Anassilaos" award for young scientific researcher.

1999 Fellowship for "Short Term Mobility" awarded by the National Research Council (CNR, Italy).

1991-1992 Post-graduate fellowship awarded by the Agriculture Department of Messina

Grants

Project commissioned by NeoLife International, LLC, USA, 2019- 2020 (scientific project head).

PRIN 2013 - 2016 (member of the research group).

PO FESR Sicilia 2007 - 2013 (member of the research group; "AGRIVET" project).

European Fund for Regional Development 1994 - 1999 (member of the research group).

PSR Calabria 2007 - 2013 (scientific project head; "ABSIB" project).

PO FESR Sicilia 2007 - 2013 (responsible for research unit; "MEPRA" project).

PRA 2008 - 2009 (member of the research group).

Health Department Sicily Region 2007 - 2008 (responsible for research unit).

Fondazione Banco di Sicilia 2007 - 2008 (scientific project head).

PRA 2006 - 2007 (scientific project head).

PRIN 2004 - 2005 (member of the research group).
POR Calabria Region 2000 – 2006 (member of the research group).
Ministerio de Ciencia y Tecnologia, Spain 2000 - 2003 (member of the research group).
PRIN 1998 - 1999 (member of the research group).
Several National Program on AIDS (Ministry of health; 1995 - 2005; member of the research group).

Main scientific interests

- mechanisms underlying cell death
- evaluation of pharmaco-toxicological profile of herbal medicines in *in vitro* and *in vivo* models
- anti-cancer effects of natural and synthetic drugs
- neuroprotective and neurodegenerative mechanisms in *in vitro* and *in vivo* models
- anti-inflammatory effects of natural and synthetic compounds

PUBLICATIONS

1. Lombardo G.E., Cirmi S., Musumeci L., Pergolizzi S., Maugeri A., Russo C., Mannucci C., Calapai G., **Navarra M.** (2020). Mechanisms underlying the anti-inflammatory activity of bergamot essential oil and its antinociceptive effects. *Plants (Basel)*, 9 (6): E704. doi: 10.3390/plants9060704.
2. Cirmi S., Celano M., Lombardo G.E., Maggisano V., Procopio A., Russo D., **Navarra M.** (2020). Oleacein inhibits STAT3, activates the apoptotic machinery, and exerts anti-metastatic effects in the SH-SY5Y human neuroblastoma cells, *Food Funct*, 11: 3271 - 3279. doi: 10.1039/d0fo00089b.
3. Ferlazzo N., Cirmi S., Maugeri A., Russo C., Lombardo G.E., Gangemi S., Calapai G., Mollace V., **Navarra M.** (2020). Neuroprotective effect of bergamot juice in 6-OHDA-induced SH-SY5Y cell death, an *in vitro* model of Parkinson's disease. *Pharmaceutics*, 2020, 12, 326. doi:10.3390/pharmaceutics12040326.
4. Cirmi S., El Abd A., Letinier L., **Navarra M.**, Salvo F. (2020). Cardiovascular toxicity of protein kinase inhibitors used in chronic myeloid leukemia: an analysis of FDA Adverse Event Reporting System Database (FAERS). *Cancers*, 2020, 12, 826. doi:10.3390/cancers12040826.
5. Calapai F., Cardia L., Sorbara E.E., **Navarra M.**, Gangemi S., Calapai G., Mannucci C. (2020). Cannabinoids, Blood-Brain Barrier, and Brain Disposition. *Pharmaceutics*. 2020, 12 (3). pii: E265. doi: 10.3390/pharmaceutics12030265.
6. Musumeci L., Maugeri A., Cirmi S., Lombardo G. E., Russo C., Gangemi S., Calapai G., **Navarra M.** (2020). *Citrus* fruits and their flavonoids in inflammatory bowel disease: an overview. *Nat Prod Res*, 34 (1): 122-136. doi: 10.1080/14786419.2019.1601196.
7. **Navarra M.**, Femia AP, Romagnoli A, Tortora K, Luceri C, Cirmi S, Ferlazzo N, Caderni G. (2020). A flavonoid-rich extract from bergamot juice prevents carcinogenesis in a genetic model of colorectal cancer, the Pirc rat (F344/NTac-Apcam1137). *Eur J Nutr*, 59 (3): 885-894. doi: 10.1007/s00394-019-01948.
8. Visalli G., Ferlazzo N., Facciola A., Picerno I., **Navarra M.**, Di Pietro A. (2020). *Ex vivo* evaluation of the effects of a white grape juice extract on lymphocytic mitochondrial functions. *Nat Prod Res*, 34 (4): 580-584. doi:10.1080/14786419.2018.1490906.

9. Askari B., Rudbari H. A., Micale N., Schirmeister T., Maugeri A., **Navarra M.** (2019). Anticancer study of heterobimetallic platinum(II)-ruthenium(II) and platinum(II)-rhodium(III) complexes with bridging dithiooxamide ligand. *J Organomet Chem*, 900: 120918. doi.org/10.1016/j.jorganchem.2019.120918.
10. Montalbano G., Mania M., Guerrera M.C., Laurà R., Abbate F., Levanti M., Germanà A., **Navarra M.** (2019). Effects of a flavonoid-rich extract from *Citrus sinensis* juice on a diet-induced obese zebrafish. *J Mol Sci*, 2019, 20: 5116. doi:10.3390/ijms20205116.
11. Maugeri A., Cirimi S., Minciullo P.L., Gangemi S., Calapai G., Mollace V., **Navarra M.** (2019). *Citrus* fruits and inflammaging: a systematic review. *Phytochem Rev*, 18:1025–1049. doi: 10.1007/s11101-019-09613-3.
12. Maugeri A., Ferlazzo N., De Luca L., Gitto R., **Navarra M.** (2019). The link between the AMPK/SIRT1 axis and a flavonoid-rich extract of *Citrus bergamia* juice: a *cell-free*, *in silico* and *in vitro* study. *Phytother Res*, 33 (7): 1805-1814. doi: 10.1002/ptr.6368.
13. Greco F., Inferrera A., La Rocca R., **Navarra M.**, Casciaro M., Grosso G., Gangemi S., Ficarra V., Mirone V. (2019). The potential role of microRNAs as biomarkers in benign prostatic hyperplasia: a systematic review and meta-analysis. *Eur Urol Focus*, 5 (3): 497-507. doi: 10.1016/j.euf.2018.01.008.
14. Cirimi S., Ferlazzo N., Gugliandolo A., Musumeci L., Mazzon E., Bramanti A., **Navarra M.** (2019). Moringin from *Moringa Oleifera* seeds inhibits growth, arrests cell-cycle, and induces apoptosis of SH-SY5Y human neuroblastoma cells through the modulation of NF-κB and apoptotic related factors. *Int. J. Mol. Sci.*, 20: 1930. doi:10.3390/ijms20081930.
15. Casciaro M., **Navarra M.**, Inferrera G., Liotta M., Gangemi S., Minciullo P.L. (2019). PPI adverse drugs reactions: a retrospective study. *Clin Mol Allergy*, 17: 1. doi: 10.1186/s12948-019-0104-4.
16. Zagni C., Citarella A., Mahjoub O., Rescifina A., Maugeri A., **Navarra M.**, Scala A., Piperno A., Micale N. (2019). Hydroxamic acid-based histone deacetylase (HDAC) inhibitors bearing a pyrazole scaffold and a cinnamoyl linker. *Int. J. Mol. Sci.* 2019, 20, 945. doi: 10.3390/ijms20040945.
17. Mancuso R., Ferlazzo N., De Luca G., Amuso R., Palumbo Piccionello A., Giofrè S. V., **Navarra M.**, Gabriele B. (2019). Synthesis, computational evaluation and pharmacological assessment of acetylsalicylic esters as anti-inflammatory agents. *Med Chem Res*, 28: 292–299. doi: 10.1007/s00044-018-02284-3.
18. Gugliandolo E., Fusco R., D'Amico R., Peditto M., Oteri G., Di Paola R., Cuzzocrea S., **Navarra M.** (2019). Treatment with a flavonoid-rich fraction of bergamot juice improved lipopolysaccharide-induced periodontitis in rats. *Front Pharmacol*, 9:1563. doi: 10.3389/fphar.2018.01563.
19. Mannucci C., Dante G., Miroddi M., Facchinetti, F., D'Anna, R., Santamaria A., Lenti, M.C., Vannacci, A., Calapai F., Perone, M., Migliardi, G., Alibrandi, A., **Navarra M.**, Calapai G. (2019). Vigilance on use of drugs, herbal products and food supplements during pregnancy: focus on fosfomycin. *J Matern Fetal Neonatal Med.*, 32 (1): 125-128. doi: 10.1080/14767058.2017.1373761.
20. Mannucci C, Pichini S, Spagnolo EV, Calapai F, Gangemi S, **Navarra M**, Calapai G. (2018). Sodium oxybate therapy for the treatment of alcohol withdrawal syndrome and the maintenance of alcohol abstinence. *Curr Drug Metab*, 19 (13), pp. 1056-1064. doi: 10.2174/1389200219666171207122227.
21. Montalbano G., Mania M., Abbate F., **Navarra M.**, Guerrera M.C., Laura R., Vega J.A., Levanti M., Germanà A. (2018). Melatonin treatment suppresses appetite genes and improves adipose tissue plasticity in diet-induced obese zebrafish. *Endocrine*, 62 (2): 381-393. doi: 10.1007/s12020-018-1653-x.
22. Mannucci C., Calapai F., Cardia L., Inferrera G., D'Arena G., Di Pietro M., **Navarra M.**, Gangemi S., Spagnolo E.V., Calapai G. (2018). Clinical Pharmacology of *Citrus aurantium* and *Citrus sinensis* for the

- Treatment of Anxiety. *Evid Based Complement Alternat Med*, Volume 2018, Article ID 3624094, 18 pages. doi: 10.1155/2018/3624094.
23. Cirimi S., **Navarra M.**, Woodside J.V., Cantwell M.M. (2018). *Citrus* fruits intake and oral cancer risk: A systematic review and meta-analysis. *Pharmacol Res*, 133: 187-194. doi: 10.1016/j.phrs.2018.05.008. IF 5.57
 24. Di Salvo E., Ventura-Spagnolo E., Casciaro M., **Navarra M.**, Gangemi S. (2018). L-33/IL-31 Axis: a potential inflammatory pathway. *Mediators Inflamm*, 11, 2018: 3858032. doi: 10.1155/2018/3858032.
 25. Casciaro M., Di Salvo E., Pace E., Ventura-Spagnolo E., **Navarra M.**, Gangemi S. (2017). Chlorinative stress in Age-Related Diseases: a literature review. *Immun Ageing*, 14, 14:21. doi: 10.1186/s12979-017-0104-5.
 26. Micali S., Territo A., Pirola G.M., Ferrari N., Sighinolfi M.C., Martorana E., **Navarra M.**, Bianchi G. (2017). A double-blind placebo controlled phase II clinical trial on the prostatic carcinoma chemoprevention by green tea catechins in patients with high-grade prostatic intraepithelial neoplasia. *Arch Ital Urol Androl*, 89 (3): 197-202. doi: 10.4081/aiua.2017.3.197.
 27. Cirimi S., Maugeri A., Ferlazzo N., Gangemi S., Calapai G., Schumacher U., **Navarra M.** (2017). Anticancer potential of *Citrus* juices and their extracts: a systematic review of both preclinical and clinical studies. *Front. Pharmacol.* 8: 420. doi: 10.3389/fphar.2017.00420.
 28. Mannucci C., **Navarra M.**, Calapai F., Spagnolo E.V., Busardò F.P., Da Cas R., Ippolito F.M., Calapai G. (2017). Neurological aspects of medical use of cannabidiol. *CNS Neurol Disord Drug Targets* 16 (5): 541-553. doi: 10.2174/1871527316666170413114210.
 29. Paterniti I., Campolo M., Siracusa R., Cordaro M., Di Paola R., Calabrese V., **Navarra M.**, Cuzzocrea S., Esposito E. (2017). Liver X receptors (LXRs) activation decreases neuroinflammation in Parkinson's disease. *PlosOne*, 12 (4): e0174470. doi: 10.1371/journal.pone.0174470.
 30. Tonacci A., Billeci L., Pioggia G., **Navarra M.**, Gangemi S. (2017). Omalizumab in chronic idiopathic urticaria: systematic review of clinical trials, evaluation of real-life studies and case reports. *Pharmacotherapy*, 37 (4): 464-480. doi: 10.1002/phar.1915.
 31. Mandalari G., Bisignano C., Cirimi S., **Navarra M.** (2017). Effectiveness of *Citrus* fruits on *Helicobacter pylori*. *Evid Based Complement Alternat Med*, Volume 2017, Article ID 8379262, 8 pages. doi: 10.1155/2017/8379262.
 32. Mondello P., Cuzzocrea S., **Navarra M.**, Mian M. (2017). Bone marrow micro-environment: a crucial player for myelomagenesis and disease progression. *Oncotarget*, 2017, 8 (12): 20394-20409. doi: 10.18632/oncotarget.14610.
 33. Currò M., Gangemi C., Giunta M., Ferlazzo N., **Navarra M.**, Ientile R., Caccamo D. (2017). Transglutaminase 2 is involved in amyloid-beta₍₁₋₄₂₎-induced pro-inflammatory activation via AP1/JNK signalling pathways in THP-1 monocytes. *Amino Acids*, 49 (3): 659–669. doi: 10.1007/s00726-016-2366-1.
 34. Mannucci C., Casciaro M., **Navarra M.**, Calapai G., Gangemi S. (2017). Involvement of miRNAs in skin disorders: a systematic review. *Allergy Asthma Proc*, 38 (1): 9-15. doi: 10.2500/aap.2017.38.4013.
 35. Fusco R., Cirimi S., Gugliandolo E., Di Paola R., Cuzzocrea S., **Navarra M.** (2017). A flavonoid-rich extract of orange juice reduced oxidative stress in an experimental model of inflammatory bowel disease. *J Funct Foods*, 30: 168–178. doi: 10.1016/j.jff.2016.12.038.
 36. Mannucci C., **Navarra M.**, Calapai F., Squeri R., Gangemi S., Calapai G. (2016). Clinical Pharmacology of *Citrus bergamia*: a systematic review. *Phytother Res*, 31 (1): 27-39. doi: 10.1002/ptr.5734.

37. Gallelli L., Falcone D., Perri M., Cione E., Pelaia G., Mesuraca M., Terracciano R., Spaziano G., D'Agostino B., **Navarra M.**, Savino R. (2016). Simvastatin overcome HDAC2 expression in Non-Small Cell Lung Cancer (NSCLC). *J Cancer Ther*, 7, 939-952. doi: 10.4236/jct.2016.712091.
38. Giofrè S.V., Cirmi S., Mancuso R., Nicolò F., Lanza G., Legnani L., Campisi A., Chiacchio M.A., **Navarra M.**, Gabriele B., Romeo R. (2016). Synthesis of spiro[isindole-1,5'-isoxazolidin]3(2H)-ones as potential inhibitors of the MDM2-p53 interaction. *Beilstein J Org Chem*, 12: 2793–2807. doi:10.3762/bjoc.12.278.
39. Cirmi S., Ferlazzo N., Lombardo G.E., Maugeri A., Calapai G., Gangemi S. **Navarra M.** (2016). Chemopreventive agents and inhibitors of cancer hallmarks: may *Citrus* offer new perspectives? *Nutrients*, 8 (11): 698. doi:10.3390/nu8110698.
40. Bagnato G., Roberts W.N., Sciortino D, Sangari D, Cirmi S., Ravanell R., **Navarra M.**, Bagnato G, Gangemi S. (2016). Mastocytosis and systemic sclerosis: a clinical association. *Clin Mol Allergy*, 14: 13. doi:10.1186/s12948-016-0050-3.
41. Cirmi S., Ferlazzo N., Lombardo G.E., Ventura-Spagnolo E., Gangemi S., Calapai G., **Navarra M.** (2016). Neurodegenerative diseases: might *Citrus* flavonoids play a protective role? *Molecules*, 21 (10): E1312. doi:10.3390/molecules21101312.
42. Pistone A., Iannazzo D., Ansari S., Milone C., Salamò M., Galvagno S., Cirmi S., **Navarra M.** (2016). Tunable doxorubicin release from polymer-gated multiwalled carbon nanotubes. *Int J Pharm*, 515: 30–36. doi: 10.1016/j.ijpharm.2016.10.010.
43. Citraro R., Russo E., Leo A., Russo R., Avagliano C., **Navarra M.**, Calignano A., De Sarro G. (2016). Pharmacokinetic-pharmacodynamic influence of N-palmitoylethanolamine, arachidonyl-2'-chloroethylamide and WIN 55,212-2 on the anticonvulsant activity of antiepileptic drugs against audiogenic seizures in DBA/2 mice. *Eur J Pharmacol*. 791: 523-534. doi: 10.1016/j.ejphar.2016.09.029.
44. Ferlazzo N., Cirmi S., Calapai G., Ventura-Spagnolo E., Gangemi S., **Navarra M.** (2016). Anti-Inflammatory Activity of *Citrus bergamia* Derivatives: Where Do We Stand? *Molecules*, 21 (10): E1273. doi: 10.3390/molecules21101273.
45. Impellizzeri D., Cordaro M., Campolo M., Gugliandolo E., Esposito E., Benedetto F., Cuzzocrea S., **Navarra M.** (2016). Anti-inflammatory and antioxidant effects of flavonoid-rich fraction of bergamot juice (BJe) in a mouse model of intestinal ischemia/reperfusion injury. *Front Pharmacol*, 7: 203. doi:10.3389/fphar.2016.00203.
46. Citraro R., **Navarra M.**, Leo A, Donato Di Paola E., Santangelo E., Lippiello P., Aiello R., Russo E., De Sarro G. (2016). The Anticonvulsant Activity of a Flavonoid-Rich Extract from Orange Juice Involves both NMDA and GABA-Benzodiazepine Receptor Complexes. *Molecules*, 21 (9): E1261. doi:10.3390/molecules21091261.
47. Cirmi S., Bisignano C., Mandalari G., **Navarra M.** (2016). Anti-infective potential of *Citrus bergamia* Risso et Poiteau (bergamot) derivatives: a systematic review. *Phytother Res*, 30: 1404–1411. doi: 10.1002/ptr.5646I.
48. Ferlazzo N., Visalli G., Cirmi S., Lombardo G.E., Laganà P., Di Pietro A., **Navarra M.** (2016). Natural iron chelators: protective role in A549 cells of flavonoids fraction from *Citrus* juices in Fe³⁺-induced oxidative stress. *Environ Toxicol Pharmacol*, 43: 248–256. doi: 10.1016/j.etap.2016.03.005.
49. Mondello P., Cuzzocrea S., **Navarra M.**, Mian M. (2016). 90 Y-ibritumomab tiuxetan: a nearly forgotten opportunity. *Oncotarget*, 7 (7): 7597-7609. doi: 10.18632/oncotarget.6531.

50. Currò M., Risitano R., Ferlazzo N., Cirimi S., Gangemi C., Caccamo D., Ientile R., **Navarra M.** (2016). *Citrus bergamia* juice extract attenuates β -amyloid-induced pro-inflammatory activation of THP-1 cells through MAPK and AP-1 pathways. *Sci Rep.* 6: 20809. doi: 10.1038/srep20809.
51. Ferlazzo N., Cirimi S., Russo M., Ursino M.R., Trapasso E., Lombardo G.E., Gangemi S., Calapai G., **Navarra M.** (2016). NF- κ B mediates the antiproliferative and proapoptotic effects of bergamot juice in HepG2 cells. *Life Sci*, 146: 81–91. doi: 10.1016/j.lfs.2015.12.040.
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53. Montalbano G., Mania M., Guerrera M.C., Abbate F., Laurà R., **Navarra M.**, Vega J.A., Ciriaco E., Germanà A. (2016). Morphological differences in adipose tissue and changes in BDNF/Trkb expression in brain and gut of a diet induced obese zebrafish model. *Ann Anat.* 204: 36–44. doi: 10.1016/j.aanat.2015.11.003.
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55. Gangemi S., Casciaro M., Trapani G., Quartuccio S., **Navarra M.**, Pioggia G., Imbalzano E. Association between HMGB1 and COPD: a systematic review. *Mediators of Inflammation*, volume 2015, article ID 164913, 8 pages. doi: 10.1155/2015/164913.
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59. Celano M., Maggisano V., De Rose R.F., Bulotta S., Maiuolo J., **Navarra M.**, Russo D. (2015). Flavonoid Fraction of *Citrus Reticulata* Juice Reduces Proliferation and Migration of Anaplastic Thyroid Carcinoma Cells. *Nutr Cancer*, 67 (7): 1183-1190. doi: 10.1080/01635581.2015.1073760.
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61. Filocamo A., Bisignano C., Ferlazzo N., Cirimi S., Mandalari G., **Navarra M.** (2015). *In vitro* effect of bergamot (*Citrus bergamia*) juice against *cagA*-positive and-negative clinical isolates of *Helicobacter pylori*. *BMC Complement Altern Med*, 15: 256. DOI 10.1186/s12906-015-0769-2.
62. Randazzo B., Abbate F., Marino F., Mancuso M., Guerrera M., Muglia U., **Navarra M.**, Germanà A. (2015). Induction of enterocolitis in zebrafish with vibrio anguillarum: a new way to induce inflammation in zebrafish intestine. *Dis Aquat Organ*, 115 (1): 47-55. doi: 10.3354/dao02864.
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64. **Navarra M.**, Ferlazzo N., Cirmi S., Trapasso E., Bramanti P., Lombardo G.E., Minciullo P.L., Calapai G., Gangemi S. (2015). Effects of bergamot essential oil and its extractive fractions on SH-SY5Y human neuroblastoma cell growth. *J Pharm Pharmacol*, 67 (8): 1042–1053. doi: 10.1111/jphp.12403.
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66. Ferlazzo N., Visalli G., Smeriglio A., Cirmi S., Lombardo G.E., Campiglia P., Di Pietro A., **Navarra M.** (2015). Flavonoid fraction of orange and bergamot juices protect human lung epithelial cells from hydrogen peroxide-induced oxidative stress. *Evid Based Complement Alternat Med.*, Volume 2015, Article ID 957031, 14 pages, 2015. doi:10.1155/2015/957031.
67. Bisignano C., Filocamo A., Mandalari G., **Navarra M.** (2015). Effect of a white grape (*Vitis vinifera L.*) juice extract on the growth and biofilm production of methicillin-resistant and -sensitive *Staphylococcus* species. *Clin Microbiol Case Rep*, 1 (2): 016.
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