Document details

Back to results | 1 of 1

Export Download Print E-mail Save to PDF Add to List More...

Full Text View at Publisher

European Journal of Medicinal Chemistry
Volume 92, 6 March 2015, Pages 191-201

Development of certain novel N-(2-(2-(2-oxoindolin-3-ylidene)hydrazinecarbonyl)phenyl)-benzamides and 3-(2-oxoindolin-3-ylideneamino)-2-substituted quinazolin-4(3 H)-ones as CFM-1 analogs: Design, synthesis, QSAR analysis and anticancer activity (Article)

Alafeefy, A.M.[a], Ashour, A.E.[b], Prasad, O.[c], Sinha, L.[c], Pathak, S.[c], Alasmari, F.A.[d], Rishi, A.K.[e,f,g], Abdel-Aziz, H.A.[h,i]

[a]Department of Pharmaceutical Chemistry, College of Pharmacy, Salman Bin Abdulaziz University, P.O. Box 173, Alkharj, 11942, Saudi Arabia
[b]Department of Pharmacology and Toxicology, College of Pharmacy, King Saud University, P.O. Box 2457, 11451, Saudi Arabia
[c]Department of Physics, University of Lucknow, Lucknow, 226007, India

View additional affiliations

Abstract

View references (32)

The reaction of N-(2-(hydrazinecarbonyl)aryl)benzamides 2a, b with indoline-2,3-diones 4ae in acidified ethanolic solution furnished the corresponding N-(2-(2-(2-oxoindolin-3-ylidene)hydrazinecarbonyl)phenyl)benzamides 5aj, respectively. Furthermore, 3-(2-oxoindolin-3-ylideneamino)-2-substituted quinazolin-4(3H)-ones 6aj were prepared by the reaction of 3-amino-2-arylquinazolin-4(3H)-one 3a, b with 4ae. Six derivatives of the twenty newly synthesized compounds showed remarkable antitumor activity against most of the tested cell lines, Daoy, UW228-2, Huh-7, Hela and MDA-MB231. Although these six compounds were more potent than the standard drug (CFM-1), indeed compounds 5b, 5d and 6b were the best candidates with IC50 values in the range 1.866.87, 4.4210.89 and 1.468.60 1/4g/ml and percentage inhibition in the range 77.188.7, 59.4184.8 and 75.488.0%, respectively. QSAR analyses on the current series of derivatives also have been performed for all five cancer cell lines and thus 10 statistically significant models were developed and internally cross validated. © 2014 Elsevier Masson SAS.

SciVal Topic Prominence

Topic: Melanoma-Specific Antigens | Cells | cancer cell

Prominence percentile: 69.625

Reaxys Database Information

View Reactions | View Compounds

Author keywords

2-oxoindolin-3-ylidene | Anticancer agents | CFM analogues | Hydrazones | Quinazoline

Indexed keywords

EMTREE drug terms:

3 (2 oxoindolin 3 ylideneamino) 2 (thiophen 2 yl)quinazolin 4(3h)one
3 (2 oxoindolin 3 ylideneamino) 2 4 tolylquinazolin 4(3h)one
3 (5 chloro 2 oxoindolin 3 ylideneamino) 2 (thiophen 2 yl)quinazolin 4(3h)one
3 (5 chloro 2 oxoindolin 3 ylideneamino) 2 4 tolylquinazolin 4(3h)one
3 (5 methoxy 2 oxoindolin 3 ylideneamino) 2 (thiophen 2 yl)quinazolin 4(3h)one
3 (5 methoxy 2 oxoindolin 3 ylideneamino) 2 4 tolylquinazolin 4(3h)one
3 (5 methyl 2 oxoindolin 3 ylideneamino) 2 (thiophen 2 yl)quinazolin 4(3h)one
3 (5 methyl 2 oxoindolin 3 ylideneamino) 2 4 tolylquinazolin 4(3h)one
3 (5 nitro 2 oxoindolin 3 ylideneamino) 2 (thiophen 2 yl)quinazolin 4(3h)one
3 (5 nitro 2 oxoindolin 3 ylideneamino) 2 4 tolylquinazolin 4(3h)one
4 methyl n (2 (2 (2 oxoindolin 3 ylidene)hydrazinecarbonyl)phenyl)benzamide
4 methyl n (2 (2 (5 methyl 2 oxoindolin 3 ylidene)hydrazinecarbonyl)phenyl)benzamide
4 methyl n (2 (2 (5 nitro 2 oxoindolin 3 ylidene)hydrazinecarbonyl)phenyl)benzamide
4 nitro n (2 (2 (2 oxoindolin 3 ylidene)hydrazinecarbonyl)phenyl)benzamide
4 nitro n (2 (2 (5 nitro 2 oxoindolin 3 ylidene)hydrazinecarbonyl)phenyl)benzamide
antineoplastic agent
benzamide derivative
n (2 (2 (5 chloro 2 oxoindolin 3 ylidene)hydrazinecarbonyl)phenyl) 4 methyl benzamide
n (2 (2 (5 chloro 2 oxoindolin 3 ylidene)hydrazinecarbonyl)phenyl) 4 nitrobenzamide
n (2 (2 (5 methoxy 2 oxoindolin 3 ylidene)hydrazinecarbonyl)phenyl) 4 methyl benzamide
n (2 (2 (5 methoxy 2 oxoindolin 3 ylidene)hydrazinecarbonyl)phenyl) 4 nitrobenzamide
n (2 (2 (5 methyl 2 oxoindolin 3 ylidene)hydrazinecarbonyl)phenyl) 4 nitrobenzamide
quinazoline derivative
unclassified drug
antineoplastic agent
benzamide derivative
benzodiazepine derivative
CFM 1
indole derivative
N-(2-(2-(2-oxoindolin-3-ylidene)hydrazinecarbonyl)phenyl)-benzamide
quinazolinone derivative

EMTREE medical terms:

antineoplastic activity
antiproliferative activity
Article
cancer cell line
drug design
drug synthesis
female
human
human cell
IC50
quantitative structure activity relation
cell proliferation
chemical structure
chemistry
dose response
drug effects
HeLa cell line
structure activity relation
synthesis
tumor cell line

MeSH:

Antineoplastic Agents
Benzamides
Benzodiazepinones
Cell Line, Tumor
Cell Proliferation
Dose-Response Relationship, Drug
Drug Design
HeLa Cells
Humans
Indoles
Molecular Structure
Quantitative Structure-Activity Relationship
Quinazolinones
Structure-Activity Relationship

Chemicals and CAS Registry Numbers:

Antineoplastic Agents; Benzamides; Benzodiazepinones; CFM 1; Indoles; N-(2-(2-(2-oxoindolin-3-ylidene)hydrazinecarbonyl)phenyl)-benzamide; Quinazolinones

Funding details

Funding sponsor	Funding number	Acronym
King Saud University		KSU
National Plan for Science, Technology and Innovation	10-MED1188-02	NPST

Funding text

This work was supported by a grant from the National Plan of Science, Technology and Innovation (Grant No. 10-MED1188-02) King Saud University, Riyadh, Saudi Arabia., and the US Department of Veterans review grant (AKR) . Appendix A

triple negative breast cancers

Cheriyan, V.T. , Muthu, M. , Patel, K.
(2016) Oncotarget

Identification and testing of novel CARP-1 functional mimetic compounds as inhibitors of non-small cell lung and triple negative breast cancers

Muthu, M. , Somagoni, J. , Cheriyan, V.T.
(2015) Journal of Biomedical Nanotechnology

View all related documents based on references

Find more related documents in Scopus based on:

Authors > Keywords >

ISSN: 02235234
CODEN: EJMCA
Source Type: Journal

DOI: 10.1016/j.ejmech.2014.12.048
PubMed ID: 25555142
Document Type: Article

Original language: English **Publisher:** Elsevier Masson SAS

References (32)

View in search results format >

All Export Print E-mail Save to PDF Create bibliography

1 Ganz, P.A.
Cancer treatment and cognitive function: Chemotherapy is not the only culprit
(2014) *ONCOLOGY (United States)*, 28 (9). Cited 2 times.
http://www.cancernetwork.com/oncology-journal/cancer-treatment-and-cognitive-function-chemotherapy-not-only-culprit

2 Garofalo, A., Goossens, L., Baldeyrou, B., Lemoine, A., Ravez, S., Six, P., David-Cordonnier, M.-H., (...), Goossens, J.-F.
Design, synthesis, and DNA-binding of N-alkyl(anilino)quinazoline derivatives
(2010) *Journal of Medicinal Chemistry*, 53 (22), pp. 8089-8103. Cited 32 times.
doi: 10.1021/jm1009605
View at Publisher

3 Khan, I., Ibrar, A., Abbas, N., Saeed, A.
Recent advances in the structural library of functionalized quinazoline and quinazolinone scaffolds: Synthetic approaches and multifarious applications
(2014) *European Journal of Medicinal Chemistry*, 76, pp. 193-244. Cited 163 times.
http://www.journals.elsevier.com/european-journal-of-medicinal-chemistry/
doi: 10.1016/j.ejmech.2014.02.005
View at Publisher

4 Wang, X., Yin, J., Shi, L., Zhang, G., Song, B.
Design, synthesis, and antibacterial activity of novel Schiff base derivatives of quinazolin-4(3H)-one
(2014) *European Journal of Medicinal Chemistry*, 77, pp. 65-74. Cited 45 times.
www.elsevier.com/gb/html/detrevue.cfm?code=EJ
doi: 10.1016/j.ejmech.2014.02.053
View at Publisher

5 Li, J., Meng, Y., Liu, Y., Feng, Z.-Q., Chen, X.-G.
F84, a quinazoline derivative, exhibits high potent antitumor activity against human gynecologic malignancies
(2010) *Investigational New Drugs*, 28 (2), pp. 132-138. Cited 8 times.
doi: 10.1007/s10637-009-9225-9
View at Publisher

6 Fry, D.W., Kraker, A.J., McMichael, A., Ambroso, L.A., Nelson, J.M., Leopold, W.R., Connors, R.W., (...), Bridges, A.J.
A specific inhibitor of the epidermal growth factor receptor tyrosine kinase
(1994) *Science*, 265 (5175), pp. 1093-1095. Cited 764 times.
doi: 10.1126/science.8066447
View at Publisher

7 Boschelli, D.H.
4-anilino-3-quinolinecarbonitriles: an emerging class of kinase inhibitors.
(2002) *Current topics in medicinal chemistry*, 2 (9), pp. 1051-1063. Cited 44 times.
doi: 10.2174/1568026023393354
View at Publisher

8 Bos, M., Mendelsohn, J., Kim, Y.-M., Albanell, J., Fry, D.W., Baselga, J.
PD153035, a tyrosine kinase inhibitor, prevents epidermal growth factor receptor activation and inhibits growth of cancer cells in a receptor number- dependent manner

(1997) *Clinical Cancer Research*, 3 (11), pp. 2099-2106. Cited 172 times.

9 Kurokawa, H., Arteaga, C.L.
Inhibition of erbB receptor (HER) tyrosine kinases as a strategy to abrogate antiestrogen resistance in human breast cancer

(2001) *Clinical Cancer Research*, 7 (12 SUPPL.), pp. 4436s-4442s. Cited 94 times.

View at Publisher

10 Sun, L., Liang, C., Shirazian, S., Zhou, Y., Miller, T., Cui, J., Fukuda, J.Y., (...), Tang, C.
Discovery of 5-[5-fluoro-2-oxo-1,2-dihydroindol-(3Z)-ylidenemethyl]-2, 4-dimethyl-1H-pyrrole-3-carboxylic acid (2-diethylaminoethyl)amide, a novel tyrosine kinase inhibitor targeting vascular endothelial and platelet-derived growth factor receptor tyrosine kinase

(2003) *Journal of Medicinal Chemistry*, 46 (7), pp. 1116-1119. Cited 398 times.
doi: 10.1021/jm0204183

View at Publisher

11 Khanwelkar, R.R., Chen, G.S., Wang, H.-C., Yu, C.-W., Huang, C.-H., Lee, O., Chen, C.-H., (...), Chern, J.-W.
Synthesis and structure-activity relationship of 6-arylureido-3-pyrrol-2-ylmethylideneindolin-2-one derivatives as potent receptor tyrosine kinase inhibitors

(2010) *Bioorganic and Medicinal Chemistry*, 18 (13), pp. 4674-4686. Cited 21 times.
doi: 10.1016/j.bmc.2010.05.021

View at Publisher

12 Heng, D.Y.C., Kollmannsberger, C.
Sunitinib

(2010) *Recent Results in Cancer Research*, 184, pp. 71-82. Cited 21 times.
ISBN: 978-364201221-1
doi: 10.1007/978-3-642-01222-8_6

View at Publisher

13 Sun, L., Tran, N., Tang, F., App, H., Hirth, P., McMahon, G., Tang, C.
Synthesis and biological evaluations of 3-substituted indolin-2-ones: A novel class of tyrosine kinase inhibitors that exhibit selectivity toward particular receptor tyrosine kinases

(1998) *Journal of Medicinal Chemistry*, 41 (14), pp. 2588-2603. Cited 421 times.
doi: 10.1021/jm980123i

View at Publisher

14 Stopeck, A., Sheldon, M., Vahedian, M., Cropp, G., Gosalia, R., Hannah, A.
Results of a phase I dose-escalating study of the antiangiogenic agent, SU5416, in patients with advanced malignancies

(2002) *Clinical Cancer Research*, 8 (9), pp. 2798-2805. Cited 139 times.

View at Publisher

15 Laird, A.D., Vajkoczy, P., Shawver, L.K., Thurnher, A., Liang, C., Mohammadi, M., Schlessinger, J., (...), Cherrington, J.M.
SU6668 is a potent antiangiogenic and antitumor agent that induces regression of established tumors

(2000) *Cancer Research*, 60 (15), pp. 4152-4160. Cited 506 times.

View at Publisher

16 Rishi, A.K., Zhang, L., Boyanapalli, M., Wali, A., Mohammad, R.M., Yu, Y., Fontana, J.A., (...), Reichert, U.
Identification and characterization of a cell cycle and apoptosis regulatory protein-1 as a novel mediator of apoptosis signaling by retinoid CD437 (Open Access)

(2003) *Journal of Biological Chemistry*, 278 (35), pp. 33422-33435. Cited 72 times.
doi: 10.1074/jbc.M303173200

View at Publisher

17 Rishi, A.K., Zhang, L., Yu, Y., Jiang, Y., Nautiyal, J., Wali, A., Fontana, J.A., (...), Majumdar, A.P.N.
Cell cycle- and apoptosis-regulatory protein-1 is involved in apoptosis signaling by epidermal growth factor receptor (Open Access)

(2006) *Journal of Biological Chemistry*, 281 (19), pp. 13188-13198. Cited 52 times.
http://www.jbc.org/cgi/reprint/281/19/13188.pdf
doi: 10.1074/jbc.M512279200

View at Publisher

18 Kim, J.H., Yang, C.K., Heo, K., Roeder, R.G., An, W., Stallcup, M.R.
CCAR1, a Key Regulator of Mediator Complex Recruitment to Nuclear Receptor Transcription Complexes (Open Access)

(2008) *Molecular Cell*, 31 (4), pp. 510-519. Cited 82 times.
doi: 10.1016/j.molcel.2008.08.001

View at Publisher

19 Puliyappadamba, V.T., Wu, W., Bevis, D., Zhang, L., Polin, L., Kilkuskie, R., Finley Jr., R.L., (...), Rishi, A.K.
Antagonists of Anaphase-promoting Complex (APC)-2-Cell Cycle and Apoptosis Regulatory Protein (CARP)-1 interaction are novel regulators of cell growth and apoptosis (Open Access)

(2011) *Journal of Biological Chemistry*, 286 (44), pp. 38000-38017. Cited 26 times.
http://www.jbc.org/content/286/44/38000.full.pdf+html
doi: 10.1074/jbc.M111.222398

View at Publisher

20 Wermuth, C.G.
The Practice of Medicinal Chemistry

(2008) *The Practice of Medicinal Chemistry*. Cited 203 times.
http://www.sciencedirect.com/science/book/9780123741943
ISBN: 978-012374194-3
doi: 10.1016/B978-0-12-374194-3.X0001-7

View at Publisher

21 Frisch, H.P.H.A., Dennington, R.D.I.I., Keith, T.A., Millam, J., Nielsen, B., Holder, A.J., Hiscocks, J.
(2009) *GaussView Version 5.0.8*. Cited 1280 times.
Gaussian, Inc. Wallingford, CT, USA

22 Becke, A.D.
Density-functional thermochemistry. III. The role of exact exchange

(1993) *The Journal of Chemical Physics*, 98 (7), pp. 5648-5652. Cited 71133 times.
doi: 10.1063/1.464913

View at Publisher

23 Lee, C., Yang, W., Parr, R.G.
Development of the Colle-Salvetti correlation-energy formula into a functional of the electron density

(1988) *Physical Review B*, 37 (2), pp. 785-789. Cited 68692 times.
doi: 10.1103/PhysRevB.37.785

View at Publisher

24 Miehlich, B., Savin, A., Stoll, H., Preuss, H.
Results obtained with the correlation energy density functionals of becke and Lee, Yang and Parr

(1989) *Chemical Physics Letters*, 157 (3), pp. 200-206. Cited 5227 times.
doi: 10.1016/0009-2614(89)87234-3

View at Publisher

25 Frisch, G.W.T.M.J., Schlegel, H.B., Scuseria, G.E., Robb, M.A., Cheeseman, J.R., Scalmani, G., Barone, V., (...), Fox, D.J.
(2009) *Gaussian 09W, Revision A.1*. Cited 8531 times.
Gaussian, Inc Wallingford, CT, USA

26 Tetko, I.V., Gasteiger, J., Todeschini, R., Mauri, A., Livingstone, D., Ertl, P., Palyulin, V.A., (...), Prokopenko, V.V.
Virtual computational chemistry laboratory - Design and description

(2005) *Journal of Computer-Aided Molecular Design*, 19 (6), pp. 453-463. Cited 978 times.
doi: 10.1007/s10822-005-8694-y

View at Publisher

27 (2007) *HyperChem (Molecular Modeling System)*. Cited 10 times.
1115 NW, 4th Street, Gainesville, FL 32601 Hypercube, Inc. USA

28 Hawkins, D.M., Basak, S.C., Mills, D.
Assessing model fit by cross-validation

(2003) *Journal of Chemical Information and Computer Sciences*, 43 (2), pp. 579-586. Cited 472 times.
doi: 10.1021/ci025626i

View at Publisher

29 Spss, I.
(2012) *Statistics for Windows*. Cited 18 times.
IBM Corp Armonk, NY, USA

30 Ashour, A.E., Jamal, S., Cheryan, V.T., Muthu, M., Zoheir, K.M.A., Alafeefy, A.M., Abd-Allah, A.R., (...), Rishi, A.K.

CARP-1 Functional Mimetics: A Novel Class of Small Molecule Inhibitors of Medulloblastoma Cell Growth (Open Access)

(2013) *PLoS ONE*, 8 (6), art. no. e66733. Cited 14 times.
http://www.plosone.org/article/fetchObject.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0066733&representation=PDF
doi: 10.1371/journal.pone.0066733

View at Publisher

31 Zhang, C., Wang, G., Zheng, Z., Maddipati, K.R., Zhang, X., Dyson, G., Williams, P., (...), Zhang, K.

Endoplasmic reticulum-tethered transcription factor cAMP responsive element-binding protein, hepatocyte specific, regulates hepatic lipogenesis, fatty acid oxidation, and lipolysis upon metabolic stress in mice (Open Access)

(2012) *Hepatology*, 55 (4), pp. 1070-1082. Cited 98 times.
doi: 10.1002/hep.24783

View at Publisher

32 Köhle, C., Badary, O.A., Nill, K., Bock-Hennig, B.S., Bock, K.W.

Serotonin glucuronidation by Ah receptor- and oxidative stress-inducible human UDP-glucuronosyltransferase (UGT) 1A6 in Caco-2 cells

(2005) *Biochemical Pharmacology*, 69 (9), pp. 1397-1402. Cited 23 times.
www.elsevier.com/locate/biochempharm
doi: 10.1016/j.bcp.2005.02.010

View at Publisher

Alafeefy, A.M.; Department of Pharmaceutical Chemistry, College of Pharmacy, Salman Bin Abdulaziz University, P.O. Box 173, Alkharj, Saudi Arabia

Back to results | 1 of 1

Top of page