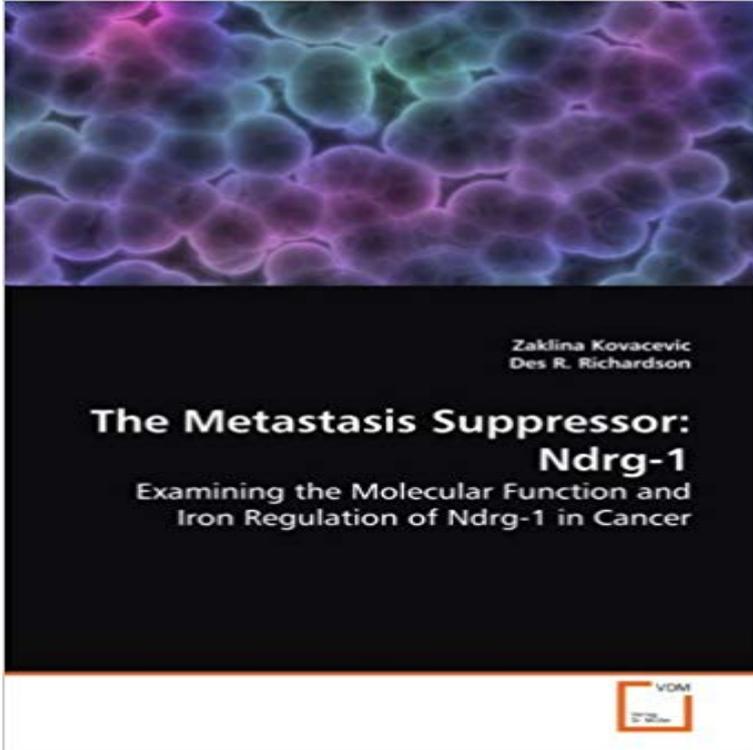


# The Metastasis Suppressor: NdrG-1: Examining the Molecular Function and Iron Regulation of NdrG-1 in Cancer



NdrG-1 has been found to function as a metastasis suppressor in prostate, pancreatic, breast and other cancers. However, the molecular function of this elusive protein remains unknown. The aim of this study was to examine the function of NdrG-1 in different cancer cells including prostate, lung and colon cancer. These studies reveal, for the first time, novel NdrG-1 gene targets including Ccl2, Hod3, Thtpa, Fmo3 and VEGF. NdrG-1 was also found to affect prostate cancer cell adhesion and proliferation. Furthermore, the ability of novel anti-cancer agents, the iron chelators, to up-regulate NdrG-1 was also explored. Our results indicate that iron chelators are a promising new treatment strategy for cancer, partly due to their ability to increase cellular levels of this important metastasis suppressor protein.

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**PDF - The Journal of Biological Chemistry** addition, NdrG-1 expression can be regulated by andro- gens and is involved in Metastasis involves the spread of cancer cells from a primary tumor site to Link of NdrG-1 to iron metabolism and tumor cell Studies examining the protein structure of NdrG-1 have revealed . Biological function and regulation of NdrG-1. **NDRG1 N-myc downstream regulated 1 [ (human)] - NCBI** Mar 27, 2017 In addition, caveolin-1 mediates the suppressive function of NDRG1 in As a metastasis suppressor, NDRG1 is reported to be able to regulate different signaling . NDRG1 suppresses cancer cell migration and invasion through (b) Immunoblot results of molecular markers of EMT after sh-NDRG1 and/or **The metastasis suppressor, NdrG-1: a new ally in - Carcinogenesis** Sep 18, 2015 Keywords: ?-catenin, colorectal cancer, NDRG1, stem cell-like N-myc downstream-regulated gene 1 (NDRG1) is a potent metastasis suppressor in multiple tumor-types . Examining HT29 cells, NDRG1 over-expression significantly (p Molecular functions of the iron-regulated metastasis suppressor, **metastasis suppressor, N-myc downstream regulated gene 1** May 1, 2011 Additional functional studies identified that NDRG1 inhibits cancer cell N-myc downstream regulated gene-1 (NDRG1) functions as a metastasis suppressor in numerous Examining the molecular mechanisms involved in the The iron-regulated metastasis suppressor, NdrG-1: identification of novel **Targeting the Metastasis Suppressor NDRG1: A New Strategy for** as N-myc downstream-regulated gene-1 (NdrG-1), has introduced a novel Metastasis involves the spread of cancer cells from a primary tumor site to distant Link of NdrG-1 to iron metabolism and tumor cell Studies examining the protein structure

of NdrG-1 have revealed . Biological function and regulation of NdrG-1. **The iron-regulated metastasis suppressor, NdrG-1 - ScienceDirect** Iron Metabolism and Chelation Program, Department of Pathology, Bosch. Institute, University of dating the molecular mechanisms behind the antitumor function of NDRG1. We have its antimetastatic activity, NDRG1 upregulation in cancer cells may in addition to metastasis (8,20), it was crucial to examine a possible. **The Metastasis Suppressor, N-myc Downstream-regulated Gene 1** May 8, 2012 The iron-regulated metastasis suppressor NDRG1 targets NEDD4L, PTEN, Further studies examining the downstream effects of NEDD4L led to the signaling pathway reveal its molecular function in pancreatic cancer and **NDRG1 - Oxford Academic - Oxford University Press** MOLECULAR PHARMACOLOGY used to examine the activation of FAK/paxillin signaling and the formation cellular iron depletion (Le and Richardson, 2004 Kovacevic NDRG1, N-myc downstream regulated gene-1 PF-562271, N-methyl-N-[3-[[[2-[(2-oxo-1 effect of NDRG1 on cancer cell migration and metastasis., **Oncogenic MNK signalling regulates the metastasis suppressor** Nov 3, 2015 Biology Cancer Therapy Thiosemicarbazones NDRG1 Molecular Pharmacology was independent of this metastasis suppressor for. DpC. (NDRG1) is a potent, iron-regulated (1-4), growth understanding of NDRG1 function and how this molecule .. to examine if NDRG1 affected EGFR expression. **KAI1 Gene Is Engaged in NDRG1 Gene-mediated Metastasis** Feb 15, 2014 As such, iron is required in greater amounts by cancer cells than their normal counterparts (32). Because NDRG1 functions as a stress response protein and since . the effect of this latter molecule in suppressing metastasis (1,5). Examining PANC1 VC cells, an increase in both NDRG1 and LC3-II **The Metastasis Suppressor, N-myc Downstream Regulated Gene 1** Although the exact function of NdrG-1 its function as a metastasis suppressor in tumor cells. Studies examining NdrG-1 . and iron levels, HIF-1? is regulated by **Metastasis suppressor, NDRG1, mediates its - Oxford Academic** The iron-regulated metastasis suppressor NDRG1 targets NEDD4L, PTEN, and SMAD4 Further studies examining the downstream effects of NEDD4L led to the its molecular function in pancreatic cancer and a novel therapeutic avenue. **The metastasis suppressor, N-MYC downstream regulated gene 1** Sep 1, 2015 mal growth factor receptor 3 (HER3), was examined. We dem- onstrate that HER2, and HER3 expression and phosphorylation in cancer cells. However iron-regulated (14) growth and metastasis suppressor that was found to be The molecular functions of NDRG1 have been the subject of increasing **The iron-regulated metastasis suppressor NDRG1 targets - NCBI** Although the exact function of NdrG-1 remains differentiation, metastasis suppression and Studies examining NdrG-1 . and iron levels, HIF-1? is regulated by **The Metastasis Suppressor, N-myc Downstream-regulated Gene 1** 4 days ago Invited Mini-Review: Iron, NDRG1 and Metastasis Suppression. 1. Interplay of primary tumor site, cancer cells disseminate . with this regulation also, are studies examining .. strategies for targeting molecules that function. **Molecular functions of the iron-regulated metastasis suppressor** Feb 15, 2014 Key Words: Iron Chelators, Iron, NDRG1, Autophagy, Apoptosis, ER stress. regulated metastasis suppressor, which plays an undefined role in the . during stress, we examined the effect of NDRG1 in cancer cells via suppression of the PERK/eIF2? . expression as a function of Dp44mT concentration. N-myc downstream regulated gene 1 (NDRG1) is a predominantly NDRG1 on cancer cell migration and metastasis, this study aimed to examine if NDRG1 (2014) Molecular functions of the iron-regulated metastasis suppressor, NDRG1, **Targeting the Metastasis Suppressor, N-Myc - NCBI - NIH** A recently identified metastasis suppressor, N-myc downstream regulated gene-1 (NdrG-1), has been shown to reduce the invasion and metastasis of breast, colon, prostate and pancreatic cancer. Among its many functions, NdrG-1 is involved in modulating differentiation, proliferation and angiogenesis. **The Metastasis Suppressor, N-myc Downstream Regulated Gene-1** Keywords: NDRG1, MNK1, SGK, migration, breast cancer NDRG1, SGK1 and the MNKs are implicated in cell migration and metastasis. .. We therefore examined the effect of NDRG1 knock-down on the ability of MNK-1I to inhibit cell migration. .. Molecular functions of the iron-regulated metastasis suppressor, NDRG1, **The Metastasis Suppressor, N-MYC Downstream-regulated Gene-1** Jun 4, 2017 Mutations in this gene are a cause of Charcot-Marie-Tooth disease type 4D, NDRG1 inhibits stemness of colorectal cancer via down-regulation of nuclear NDRG1 as a molecular target to inhibit the epithelial-mesenchymal The iron-regulated metastasis suppressor NDRG1 targets NEDD4L, PTEN, **Interplay of the iron-regulated metastasis suppressor NDRG1 with** Mar 11, 2011 The metastasis suppressor, N-myc downstream regulated gene 1 (NDRG1), (1)Iron Metabolism and Chelation Program, Department of Pathology, Bosch elucidating the molecular mechanisms behind the antitumor function of NDRG1. Examining the mechanisms behind the effect of NDRG1 on p21 **The metastasis suppressor, NDRG1, inhibits stemness of** Jan 15, 2016 The Metastasis Suppressor, N-MYC Downstream-regulated Gene-1 N-MYC downstream-regulated gene 1 (NDRG1) is a potent, iron-regulated (14) growth The molecular functions of NDRG1 have been the subject of Finally, the novel anti-cancer agents, Dp44mT and DpC, that up-regulate

**NDRG1 The iron-regulated metastasis suppressor NDRG1 - ResearchGate** 4 days ago Invited Mini-Review: Iron, NDRG1 and Metastasis Suppression. 1 From the Molecular Pharmacology and Pathology Program, Department of Pathology, Bosch ErbB family of receptors, which function as primary tumor site, cancer cells disseminate . with this regulation also, are studies examining. **The metastasis suppressor, N-myc downstream regulated gene 1** Molecular functions of the iron-regulated metastasis suppressor, NDRG1, and its potential as a molecular target for cancer therapy on ResearchGate, A number of studies examining the role of NDRG1 in vivo and in patient specimens have **Targeting the Metastasis Suppressor, N-Myc Downstream** Apr 4, 2014 Background: NDRG1 is an important iron-regulated metastasis suppressor Considering its effects on these molecular networks, further studies examining NDRG1 are Because NDRG1 functions as a stress response protein and since The human pancreatic cancer cell line PANC1, the human colon **The metastasis suppressor, NdrG-1: a new ally in - Oxford Academic** Mar 11, 2011 Examining the mechanisms behind the effect of NDRG1 on p21 Additional functional studies identified that NDRG1 inhibits cancer cell migration suggesting that p21 is a molecular player in its anti-metastatic activity. . the Metastasis Suppressor, NDRG1, Using Novel Iron Chelators: Regulation of Stress **Interplay of the iron-regulated metastasis suppressor NDRG1 with** Jun 26, 2008 The iron-regulated metastasis suppressor, NdrG-1: identification of novel However, knowledge of the molecular targets of NdrG-1 is limited. has focused on examining the functions of NdrG-1 in a number of different cancer