



< Back to results | 1 of 1

[Download](#) [Print](#) [Save to PDF](#) [Add to List](#) [Create bibliography](#)
Open Access Macedonian Journal of Medical Sciences • Open Access • Volume 10, Issue T7, Pages 23 - 29 • 1 January 2022
Document type

Article • Gold Open Access • Green Open Access

Source type

Journal

ISSN

18579655

DOI

10.3889/oamjms.2022.9282

Publisher

Scientific Foundation SPIROSKI

Original language

English

View less

Sex Differences in Neuropeptide Y Serum, But Not in Fat Intake and Body Mass Index

Sari, Dina Keumala^a ; Ichwan M.^b; Masyithah, Dewi^c; Dharmajaya, Ridha^d; Khatib, Alfie^e^a Department of Nutrition, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia^b Department of Pharmacology, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia^c Department of Parasitology, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia^d Department of Neurosurgery, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia^e Kulliyah of Pharmacy, International Islamic University Malaysia, Selangor, Malaysia

Hide additional affiliations

12

Views count

[View all metrics >](#)[Full text options](#) [Export](#)

Cited by 0 documents

Inform me when this document
is cited in Scopus:[Set citation alert >](#)**Related documents**

The incidence of adult obesity is associated with parental and adolescent histories of obesity in North Sumatra, Indonesia: A cross-sectional study

Sari, D.K., Ichwan, M., Masyithah, D. (2021) *Journal of Multidisciplinary Healthcare*

Polymorphism rs16147 of the neuropeptide Y gene modifies the response of cardiovascular risk biomarkers and adipokines to two hypocaloric diets

De Luis, D.A., Izaola, O., Primo, D. (2017) *Journal of Nutrigenetics and Nutrigenomics*

Allele a of the rs16147 variant of neuropeptide Y predicts early metabolic improvements after bariatric surgery with biliopancreatic diversion in morbid obese subjects

[View PDF](#)

Pacheco, D., Izaola, O., Primo, D. (2021) *Clinical Nutrition Open Science*

[View all related documents based on references](#)

Find more related documents in Scopus based on:

[Authors >](#) [Keywords >](#)**Abstract****Author keywords****Sustainable Development Goals 2023****SciVal Topics****Metrics****Funding details**

Abstract

BACKGROUND: One's appetite has a role in controlling food intake and maintaining energy balance, but its effect on body metabolism related to obesity is still questionable. **AIM:** The purpose of this study was to determine the levels of neuropeptide Y in healthy people and to see differences in gender and anthropometric parameters. The hypothesis of this study was that there would be differences in neuropeptide Y levels in groups with gender and anthropometric parameter differences. **METHODS:** This study was a cross-sectional study involving 62 study subjects, male and female, who did not have chronic diseases or metabolic disorders. This research was conducted from April to September 2020. The parameters examined in this study were neuropeptide Y levels and anthropometric parameters. The statistical analysis performed was the Mann–Whitney test to see the differences between groups. **RESULTS:** The mean age of the research subjects was 40.48 ± 10.85 years, with the same ethnic distribution. The distribution of men and women was more women than men. Based on anthropometric examination, it was found that obesity nutritional status was more common in the female group than in the male group; however, serum neuropeptide Y levels were found to be significantly different between male and female groups (male group was higher) which were 348.37 ± 330.09 ng/L, $p = 0.036$. **CONCLUSIONS:** The study found significant differences in serum neuropeptide Y levels in male and female groups, with neuropeptide Y levels being higher in men than in women. © 2022 Dina Keumala Sari, M. Ichwan, Dewi Masyithah, Ridha Dharmajaya, and Alfi Khatib.

Author keywords

Appetite; Gender; Neuropeptide; Obesity; Orexigenic

Sustainable Development Goals 2023 [\(i\)](#) New [▼](#)

SciVal Topics [\(i\)](#) [▼](#)

Metrics [▼](#)

Funding details [^](#)

Funding sponsor	Funding number	Acronym
-----------------	----------------	---------

Lembaga Penelitian Universitas Sumatera Utara

[View PDF](#)

TALENTA Universitas Sumatera Utara

Funding text

This project was funded, in part, by the Lembaga Penelitian Universitas Sumatera Utara according to TALENTA Universitas Sumatera Utara, year 2020, no. 4142/UN5.1.R/PPM/2020, Date: April 27, 2020.

[References \(41\)](#)

[View in search results format >](#)

All

[Export](#) [Print](#) [E-mail](#) [Save to PDF](#) [Create bibliography](#)

- 1 Gums, M.C.R., Eggels, L., Kool, T., Unmehopa, U.A., van den Heuvel, J.K., Lamuadni, K., Mul, J.D., (...), la Fleur, S.E.

Neuropeptide Y Signaling in the Lateral Hypothalamus Modulates Diet Component Selection and is Dysregulated in a Model of Diet-Induced Obesity

(2020) *Neuroscience*, 447, pp. 28-40. Cited 14 times.

www.elsevier.com/locate/neuroscience

doi: 10.1016/j.neuroscience.2019.12.014

[View at Publisher](#)

-
- 2 Meneguetti, B.T., Cardoso, M.H., Ribeiro, C.F.A., Felício, M.R., Pinto, I.B., Santos, N.C., Carvalho, C.M.E., (...), Franco, O.L.

Neuropeptide receptors as potential pharmacological targets for obesity

(2019) *Pharmacology and Therapeutics*, 196, pp. 59-78. Cited 11 times.

www.elsevier.com/locate/pharmthera

doi: 10.1016/j.pharmthera.2018.11.002

[View at Publisher](#)

-
- 3 Wu, Y., He, H., Cheng, Z., Bai, Y., Ma, X.

The role of neuropeptide y and peptide yy in the development of obesity via gut-brain axis ([Open Access](#))

(2019) *Current Protein and Peptide Science*, 20 (7), pp. 750-758. Cited 44 times.

<http://www.eurekaselect.com/CDN/download.php?param=Sk9VuUk5ABTffMvQjkVOaL0N6QUfjMvM6jAvpNy80wMDeE2S3y5wgZGZ28fGxFwcuGxpoY2Fc0aWA9uL13Bk1ZnxC8NDmRhYwzM31N2jslNWnMzMeGNlgMzZc|ZD2A3ZfjQ5DZjU73NmpM4NtWYTcVYb&key=VWlxdrwljuZEqUtQrVNE9c2RxZZkyJQtTMyfRDMy1Rjmc1NiDV2sLTQs3MzoItM0jM1knjQAzMjuNER32VHeATcVYdTcVY>

doi: 10.2174/1389203720666190125105401

[View at Publisher](#)

-
- 4 Zain, S.M., Mohamed, Z., Jalaludin, M.Y., Fauzi, F., Hamidi, A., Zaharan, N.L.

Comprehensive evaluation of the neuropeptide-Y gene variants in the risk of obesity: A case-control study and meta-Analysis

[View PDF](#)

(2015) *Pharmacogenetics and Genomics*, 25 (10), pp. 501-510. Cited 20 times.

<http://journals.lww.com/jpharmacogenetics>

doi: 10.1097/FPC.0000000000000164

[View at Publisher](#)

-
- 5 Väätälö, L.H., Ruohonen, S.T., Mäkelä, S., Ailanen, L., Penttinen, A.-M., Stormi, T., Kauko, T., (...), Di Marzo, V.

Role of the endocannabinoid system in obesity induced by neuropeptide y overexpression in noradrenergic neurons ([Open Access](#))

(2015) *Nutrition and Diabetes*, 5, art. no. e151. Cited 9 times.

<http://www.nature.com/nutd/index.html>

doi: 10.1038/nutd.2015.1

[View at Publisher](#)

- 6 Subramanian, M., Jayakumar, S., Richhariya, S., Hasan, G.
Loss of IP₃ receptor function in neuropeptide secreting neurons leads to obesity in adult Drosophila
(2013) *BMC Neuroscience*, 14, art. no. 157. Cited 19 times.
<http://www.biomedcentral.com/1471-2202/14/157>
doi: 10.1186/1471-2202-14-157
[View at Publisher](#)
-
- 7 Kim, N.S., Ko, M.M., Cha, M.H., Oh, S.-M., Bang, O.S.
Age and sex dependent genetic effects of neuropeptide Y promoter polymorphism on susceptibility to ischemic stroke in Koreans
(2010) *Clinica Chimica Acta*, 411 (17-18), pp. 1243-1247. Cited 13 times.
doi: 10.1016/j.cca.2010.04.026
[View at Publisher](#)
-
- 8 Bowles, W.R., Burke, R., Sabino, M., Harding-Rose, C., Lunos, S., Hargreaves, K.M.
Sex differences in neuropeptide content and release from rat dental pulp ([Open Access](#))
(2011) *Journal of Endodontics*, 37 (8), pp. 1098-1101. Cited 6 times.
doi: 10.1016/j.joen.2011.03.007
[View at Publisher](#)
-
- 9 Allison, S.J., Baldock, P.A., Enriquez, R.F., Lin, E., During, M., Gardiner, E.M., Eisman, J.A., (...), Herzog, H.
Critical interplay between neuropeptide Y and sex steroid pathways in bone and adipose tissue homeostasis
(2009) *Journal of Bone and Mineral Research*, 24 (2), pp. 294-304. Cited 40 times.
doi: 10.1359/jbmr.081013
[View at Publisher](#)
-
- 10 Liu, Y., Wu, D., Qu, M.-Y., He, J.-L., Yuan, M., Zhao, M., Wang, J.-X., (...), Li, B.-Y.
Neuropeptide Y-mediated sex-and afferent-specific neurotransmissions contribute to sexual dimorphism of baroreflex afferent function ([Open Access](#))
(2016) *Oncotarget*, 7 (40), pp. 66135-66148. Cited 10 times.
<http://www.impactjournals.com/oncotarget/index.php?journal=oncotarget&page=article&op=download&path%5B%5D=11880&path%5B%5D=37616>
doi: 10.18632/oncotarget.11880
[View at Publisher](#)
-
- 11 Sanchez, C., El Khoury, A., Hassan, M., Wegener, G., Mathé, A.A.
Sex-dependent behavior, neuropeptide profile and antidepressant response in rat model of depression ([Open Access](#))
(2018) *Behavioural Brain Research*, 351, pp. 93-103. Cited 13 times.
www.elsevier.com/locate/bbr
doi: 10.1016/j.bbr.2018.05.029
[View at Publisher](#)

[View PDF](#)

- 12 Park, S., Mori, R., Shimokawa, I.
The fat regulator neuropeptide Y and caloric restriction
([Open Access](#))
- (2017) *Aging*, 9 (11), pp. 2243-2244. Cited 3 times.
<https://s3-us-west-1.amazonaws.com/paperchase-aging/pdf/EtRk9PuTKcfBQS7XZ.pdf>
doi: 10.18632/aging.101337
- [View at Publisher](#)
-
- 13 Lutz, T.A.
Neuropeptide Y helps us to deposit fat in adipose tissue
([Open Access](#))
- (2015) *Acta Physiologica*, 213 (4), pp. 753-755. Cited 6 times.
[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1748-1716](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1748-1716)
doi: 10.1111/apha.12461
- [View at Publisher](#)
-
- 14 Lin, X., Qi, Q., Zheng, Y., Huang, T., Lathrop, M., Zelenika, D., Bray, G.A., (...), Qi, L.
Neuropeptide y genotype, central obesity, and abdominal fat distribution: The POUNDS LOST trial
- (2015) *American Journal of Clinical Nutrition*, 102 (2), pp. 514-519. Cited 32 times.
<http://ajcn.nutrition.org/content/102/2/514.full.pdf+html>
doi: 10.3945/ajcn.115.107276
- [View at Publisher](#)
-
- 15 Wang, G., Williams, C.A., McConn, B.R., Cline, M.A., Gilbert, E.R.
A high fat diet enhances the sensitivity of chick adipose tissue to the effects of centrally injected neuropeptide Y on gene expression of adipogenesis-associated factors ([Open Access](#))
- (2017) *Comparative Biochemistry and Physiology -Part A : Molecular and Integrative Physiology*, 211, pp. 49-55. Cited 7 times.
<https://www.journals.elsevier.com/comparative-biochemistry-and-physiology-part-a-molecular-and-integrative-physiology>
doi: 10.1016/j.cbpa.2017.06.006
- [View at Publisher](#)
-
- 16 Wang, X.J., Xu, S.H., Liu, L., Song, Z.G., Jiao, H.C., Lin, H.
Dietary fat alters the response of hypothalamic neuropeptide Y to subsequent energy intake in broiler chickens ([Open Access](#))
- (2017) *Journal of Experimental Biology*, 220 (4), pp. 607-614. Cited 11 times.
<http://jeb.biologists.org/content/jexbio/220/4/607.full.pdf>
doi: 10.1242/jeb.143792
- [View at Publisher](#)

[View PDF](#)

- 17 Park, S., Komatsu, T., Kim, S.E., Tanaka, K., Hayashi, H., Mori, R., Shimokawa, I.

Neuropeptide Y resists excess loss of fat by lipolysis in calorie-restricted mice: a trait potential for the life-extending effect of calorie restriction

(2017) *Aging Cell*, 16 (2), pp. 339-348. Cited 20 times.

[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1474-9726](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1474-9726)

doi: 10.1111/acel.12558

[View at Publisher](#)

-
- 18 Kim, Y.J., Bi, S.

Knockdown of neuropeptide Y in the dorsomedial hypothalamus reverses high-fat diet-induced obesity and impaired glucose tolerance in rats ([Open Access](#))

(2016) *American Journal of Physiology - Regulatory Integrative and Comparative Physiology*, 310 (2), pp. R134-R142. Cited 25 times.

<http://ajpregu.physiology.org/content/310/2/R134.full.pdf>

doi: 10.1152/ajpregu.00174.2015

[View at Publisher](#)

-
- 19 Hassan, A.M., Mancano, G., Kashofer, K., Fröhlich, E.E., Matak, A., Mayerhofer, R., Reichmann, F., (...), Holzer, P.

High-fat diet induces depression-like behaviour in mice associated with changes in microbiome, neuropeptide Y, and brain metabolome ([Open Access](#))

(2019) *Nutritional Neuroscience*, 22 (12), pp. 877-893. Cited 105 times.

<http://www.tandfonline.com/loi/ynns20#.VvukQLdf1Hh>

doi: 10.1080/1028415X.2018.1465713

[View at Publisher](#)

-
- 20 (2000) *The Asia-Pacific Perspective: Redefining Obesity and Its Intervention*. Cited 3260 times.

Australia: Health Communications Australia Pte. Limited; Available form:

[Last accessed on 2021 Jun 25]

<https://apps.who.int/iris/handle/10665/206936>

[View PDF](#)

-
- 21 Kementerian Kesehatan, RI.

(2019) *Angka Kecukupan Gizi bagi Bangsa Indonesia*, p. 33. Cited 3 times.
K.K.R. Indonesia. Jakarta: Kementerian Kesehatan RI

-
- 22 Gan, L., England, E., Yang, J.-Y., Toulme, N., Ambati, S., Hartzell, D.L., Meagher, R.B., (...), Baile, C.A.

A 72-hour high fat diet increases transcript levels of the neuropeptide galanin in the dorsal hippocampus of the rat ([Open Access](#))

(2015) *BMC Neuroscience*, 16 (1), art. no. 51. Cited 16 times.

<http://www.biomedcentral.com/bmcneurosci/>

doi: 10.1186/s12868-015-0188-9

[View at Publisher](#)

- 23 Lu, Y., Van Bever, H.P.S., Lim, T.K., Kuan, W.S., Goh, D.Y.T., Mahadevan, M., Sim, T.B., (...), Ng, T.P.
Obesity, asthma prevalence and IL-4: Roles of inflammatory cytokines, adiponectin and neuropeptide Y ([Open Access](#))
(2015) *Pediatric Allergy and Immunology*, 26 (6), pp. 530-536. Cited 34 times.
[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1399-3038](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1399-3038)
doi: 10.1111/pai.12428
[View at Publisher](#)
-
- 24 Väätalo, L.H., Ruohonen, S.T., Ailanen, L., Savontaus, E.
Neuropeptide Y in noradrenergic neurons induces obesity in transgenic mouse models ([Open Access](#))
(2016) *Neuropeptides*, 55, pp. 31-37. Cited 20 times.
<http://www.elsevier-international.com/journals/npep/>
doi: 10.1016/j.npep.2015.11.088
[View at Publisher](#)
-
- 25 Moreno-Herrera, A., García, A., Palos, I., Rivera, G.
Neuropeptide Y1 and Y5 receptor antagonists as potential anti-obesity drugs: Current status
(2014) *Mini-Reviews in Medicinal Chemistry*, 14 (11), pp. 896-919. Cited 10 times.
http://www.benthamdirect.org/pages/all_b_bypublication.php
doi: 10.2174/1389557514666141029233816
[View at Publisher](#)
-
- 26 Sitticharoon, C., Chatree, S., Churintaraphan, M.
Expressions of neuropeptide Y and Y1 receptor in subcutaneous and visceral fat tissues in normal weight and obese humans and their correlations with clinical parameters and peripheral metabolic factors
(2013) *Regulatory Peptides*, 185, pp. 65-72. Cited 32 times.
doi: 10.1016/j.regpep.2013.06.015
[View at Publisher](#)
-
- 27 Yonaha, H., Minoura, H., Yoshida, T., Takeuchi, S., Noda, N., Tanaka, K., Nishiura, R., (...), Toyoda, N.
Expression of neuropeptide Y is increased in murine endometrial epithelium during the peri-implantation period under regulation by sex steroids
(2004) *Reproduction, Fertility and Development*, 16 (3), pp. 355-361. Cited 4 times.
doi: 10.1071/RD02088
[View at Publisher](#)
-
- 28 Qin, Q., Chen, P., Cui, Z., Wang, J., Xie, B., Zhang, S., Mei, X., (...), Wang, S.
Neuropeptide Y knockdown in the dorsomedial hypothalamus improved basal and obesity-induced decrease in bone mass density
(2019) *Neuroendocrinology Letters*, 40 (6), pp. 289-296. Cited 2 times.
www.nel.edu
-

[View PDF](#)

- 29 Koo, B.K., Kim, S.W., Yi, K.H., Park, K.S., Moon, M.K.
Changing relative contribution of abdominal obesity and a family history of diabetes on prevalence of diabetes mellitus in Korean men and women aged 30-49 years from 2001 to 2010 ([Open Access](#))

(2015) *Journal of Diabetes*, 7 (4), pp. 465-472. Cited 12 times.
[http://onlinelibrary.wiley.com/journal/10.1111/\(ISSN\)1753-0407](http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1753-0407)
doi: 10.1111/1753-0407.12202

[View at Publisher](#)

-
- 30 Chan, K.S., Lai, L.K.P., Chan, P.F., Chao, D.V.K.
The patient 37-year-old man
- (2019) *Journal of Family Practice*, 68 (2), pp. 109-112.
<https://mdedge-files-live.s3.us-east-2.amazonaws.com/files/s3fs-public/JFP06803109.PDF>

-
- 31 Lowe, M.R., Shank, L.M., Mikorski, R., Butryn, M.L.
Personal history of dieting and family history of obesity are unrelated: Implications for understanding weight gain proneness
- (2015) *Eating Behaviors*, 17, pp. 144-148.
<http://www.elsevier.com/locate/eatbeh>
doi: 10.1016/j.eatbeh.2015.01.002

[View at Publisher](#)

-
- 32 Reuter, C.P., Burgos, M.S., Bernhard, J.C., Tornquist, D., Klinger, E.I., Borges, T.S., Renner, J.D.P., (...), de Mello, E.D.
Association between overweight and obesity in schoolchildren with rs9939609 polymorphism (FTO) and family history for obesity ([Open Access](#))

(2016) *Jornal de Pediatria*, 92 (5), pp. 493-498. Cited 18 times.
<http://www.elsevier.com/journals/jornal-de-pediatria/0021-7557>
doi: 10.1016/j.jped.2015.11.005

[View at Publisher](#)

[View PDF](#)

-
- 33 Saunders, T.J., Tremblay, M.S., Mathieu, M.-È., Henderson, M., O'Loughlin, J., Tremblay, A., Chaput, J.-P.
Associations of sedentary behavior, sedentary bouts and breaks in sedentary time with cardiometabolic risk in children with a family history of obesity

(2013) *PLoS ONE*, 8 (11), art. no. e79143. Cited 146 times.
<http://www.plosone.org/article/fetchObject.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0079143&representation=PDF>
doi: 10.1371/journal.pone.0079143

[View at Publisher](#)

- 34 Corica, D., Aversa, T., Valenzise, M., Messina, M.F., Alibrandi, A., De Luca, F., Wasniewska, M.

Does family history of obesity, cardiovascular, and metabolic diseases influence onset and severity of childhood obesity? ([Open Access](#))

(2018) *Frontiers in Endocrinology*, 9 (MAY), art. no. 187. Cited 42 times.
<https://www.frontiersin.org/articles/10.3389/fendo.2018.00187/full>
doi: 10.3389/fendo.2018.00187

[View at Publisher](#)

-
- 35 Romero-Ibarguenoitia, M.E., Vadillo-Ortega, F., Caballero, A.E., Ibarra-González, I., Herrera-Rosas, A., Serratos-Canales, M.F., León-Hernández, M., (...), López-Alvarenga, J.C.

Family history and obesity in youth, their effect on acylcarnitine/aminoacids metabolomics and non-alcoholic fatty liver disease (NAFLD). Structural equation modeling approach ([Open Access](#))

(2018) *PLoS ONE*, 13 (2), art. no. e0193138. Cited 26 times.
<http://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0193138&type=printable>
doi: 10.1371/journal.pone.0193138

[View at Publisher](#)

-
- 36 Sull, J.W., Kim, S., Jee, S.H.

Effects of Obesity and Family History of Diabetes on the Association of CETP rs6499861 with HDL-C Level in Korean Populations ([Open Access](#))

(2019) *Journal of Lipid and Atherosclerosis*, 8 (2), pp. 252-257. Cited 4 times.
<https://e-jla.org/pdf/10.12997/jla.2019.8.2.252>
doi: 10.12997/jla.2019.8.2.252

[View at Publisher](#)

-
- 37 Nahvi, R.J., Sabban, E.L.

Sex differences in the neuropeptide Y system and implications for stress related disorders ([Open Access](#))

(2020) *Biomolecules*, 10 (9), art. no. 1248, pp. 1-21. Cited 26 times.
<https://www.mdpi.com/2218-273X/10/9/1248/pdf>
doi: 10.3390/biom10091248

[View at Publisher](#)

[View PDF](#)

-
- 38 Rugarn, O., Hammar, M., Theodorsson, A., Theodorsson, E., Stenfors, C.

Sex differences in neuropeptide distribution in the rat brain

(1999) *Peptides*, 20 (1), pp. 81-86. Cited 44 times.
doi: 10.1016/S0196-9781(98)00139-9

[View at Publisher](#)

- 39 Senthilkumar, R., Srinivasan, R.
Sex-specific spatial and temporal gene expressions of Pheromone biosynthesis activating neuropeptide (PBAN) and binding proteins (PBP/OBP) in *Spoladea recurvalis*
(2019) *Scientific Reports*, 9 (1), art. no. 3515. Cited 6 times.
www.nature.com/scientificreports/index.html
doi: 10.1038/s41598-019-39822-x
[View at Publisher](#)
-
- 40 Mele, P., Zammaretti, F., Longo, A., Panzica, G., Oberto, A., Eva, C.
Sex-dependent regulation of hypothalamic neuropeptide Y-Y1 receptor gene expression in leptin treated obese (ob/ob) or lean mice ([Open Access](#))
(2016) *Brain Research*, Part A 1649, pp. 102-109. Cited 13 times.
www.elsevier.com/locate/bri
doi: 10.1016/j.brainres.2016.07.022
[View at Publisher](#)
-

- 41 Painsipp, E., Herzog, H., Sperk, G., Holzer, P.
Sex-dependent control of murine emotional-affective behaviour in health and colitis by peptide YY and neuropeptide y ([Open Access](#))
(2011) *British Journal of Pharmacology*, 163 (6), pp. 1302-1314. Cited 73 times.
doi: 10.1111/j.1476-5381.2011.01326.x
[View at Publisher](#)

 Sari, D.K.; Department of Nutrition, Faculty of Medicine, Universitas Sumatera Utara, Medan, Indonesia; email:dina@usu.ac.id
© Copyright 2022 Elsevier B.V., All rights reserved.

About Scopus

[What is Scopus](#)

[Content coverage](#)

[Scopus blog](#)

[Scopus API](#)

[Privacy matters](#)

Language

[日本語版を表示する](#)

[查看简体中文版本](#)

[查看繁體中文版本](#)

[Просмотр версии на русском языке](#)

Customer Service

[Help](#)

[Tutorials](#)

[Contact us](#)

ELSEVIER

[Terms and conditions](#) ↗ [Privacy policy](#) ↗

All content on this site: Copyright © 2023 Elsevier B.V. ↗ its licensors, and contributors. All rights are reserved, including those for text and data mining, AI training, and similar technologies. For all open access content, the Creative Commons licensing terms apply.

We use cookies to help provide and enhance our service and tailor content. By continuing, you agree to the use of cookies ↗.



[View PDF](#)