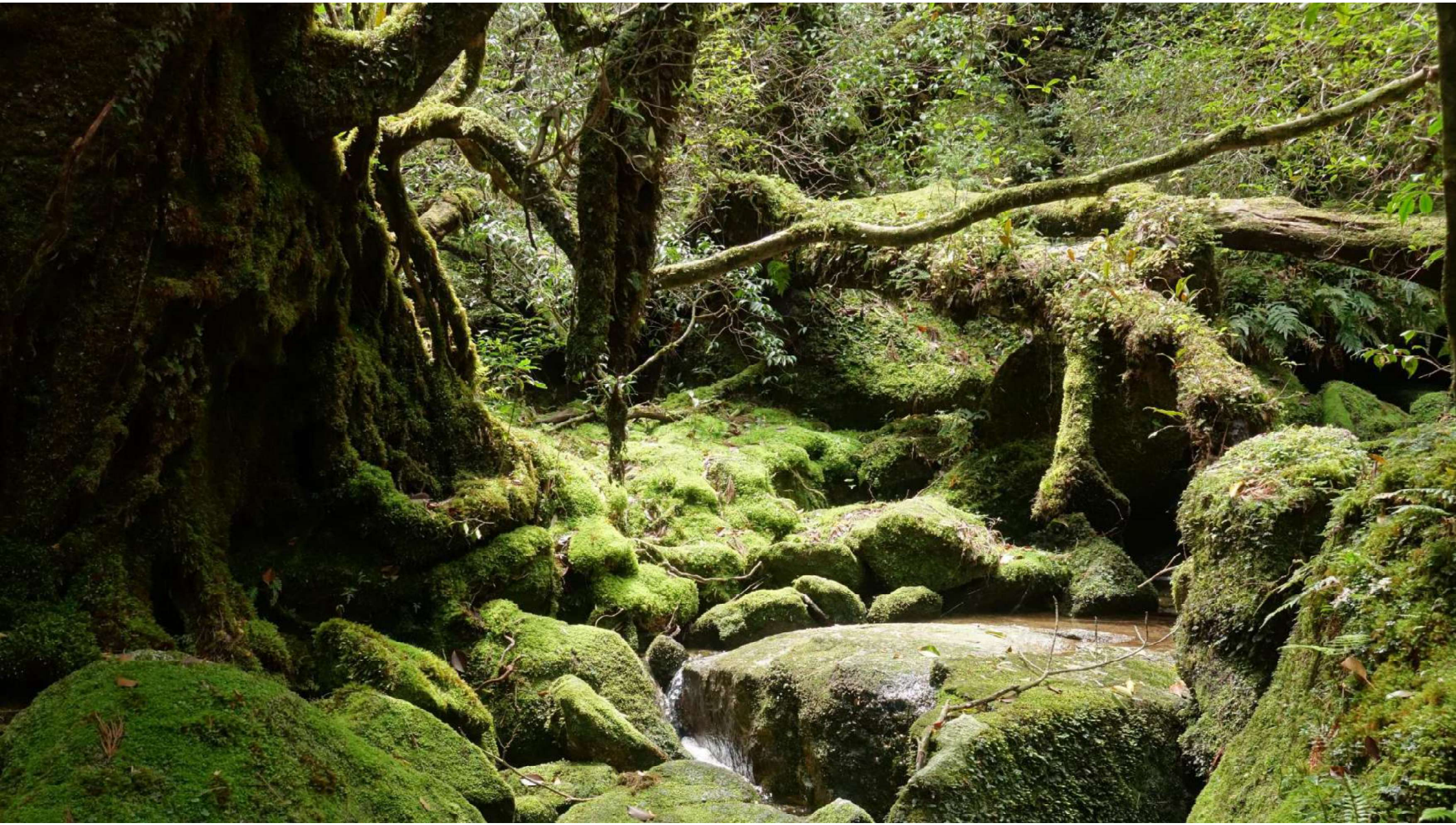
Natur als Gesundheitsquelle

"Wie Wald und Landschaft unsere Gesundheit stärken"

Dipl. Arzt Tomáš Hraško
Nature und Forest Therapy Guide ANFT
Medical Director & Co-founder Phoenix Health
Belegarzt für Endokrinologie und Diabetologie FMH Seegarten Klinik Kilchberg
Ärztliche Leitung der Fortbildung Klinische Umweltmedizin SCOPRO
Mitglied ESE, EGKU, AefU, BUND, SSAAMP und SGED

www.phoenixhealth.ch

Dr. med. (CZ) Tomáš Hraško, Natur als Gesundheitsquelle, Mitgliederversammlung der Schweizerischen Gesellschaft Naturtherapie und Waldbaden SGNW, 22.11.2025 ZHAW in Wädenswil,; www.phoenixhealth.ch, Verwendung nur mit Genehmigung des Autors©



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1 Mein Weg zum Waldbaden

Kindheit in der Natur, Endokrinologie und Klinische Umweltmedizin Interesse

2004-2011	Humanmedizin Karls-Universität in Prag, Tschechien, Promotion summa cum laude
2011-2015	Endokrinologie-Diabetologie Weiterbildung, Endokrinologisches Institut in Prag PhD Start
2016-ggw.	Facharzt für Endokrinologie und Diabetologie, seit 2015 in der Schweiz tätig
2021-ggw.	Ärztliche Leitung der Fortbildung Klinische Umweltmedizin SCOPRO
2024-ggw.	Nature and Forest Therapy Guide (ANFT, Yakushima)
2024-ggw.	Ärztlicher Leiter und Co-Founder Phoenix Health Platform und Waldbaden Guide ANFT

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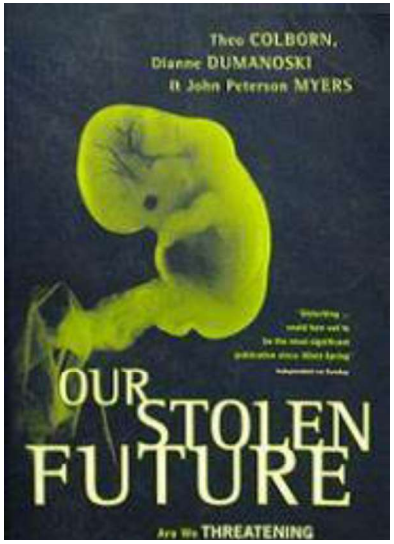
ANFT.earth

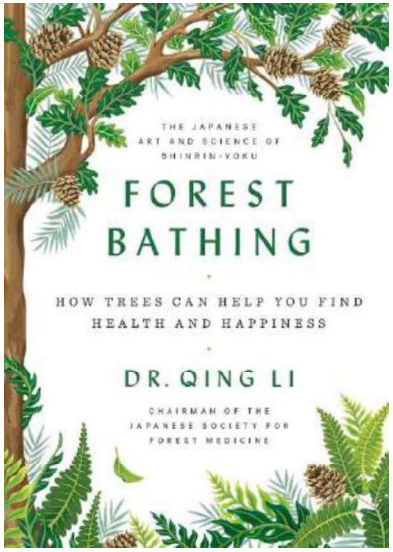
1 Mein bisheriger Weg zum Waldbaden

Ursachenmedizin-Umweltmedizin Interesse und Waldmedizin

Dr. med. Peter Ohnsorge

Prof. Dr. Qing Li, PhD





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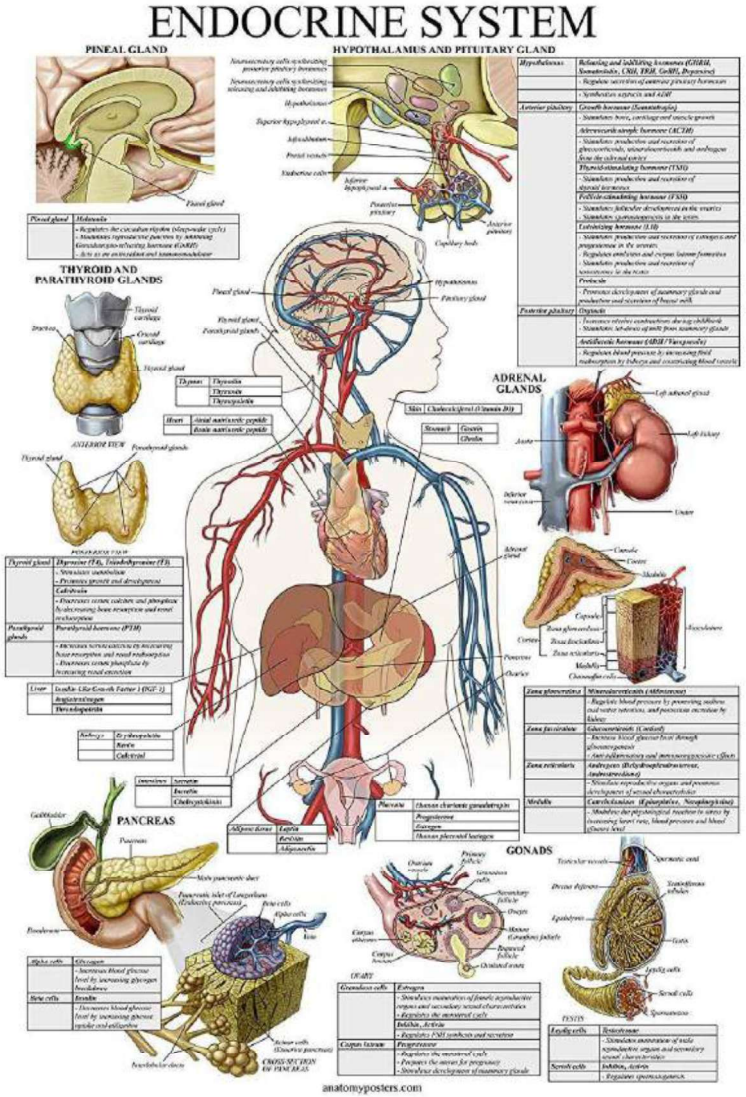
MAMMUT

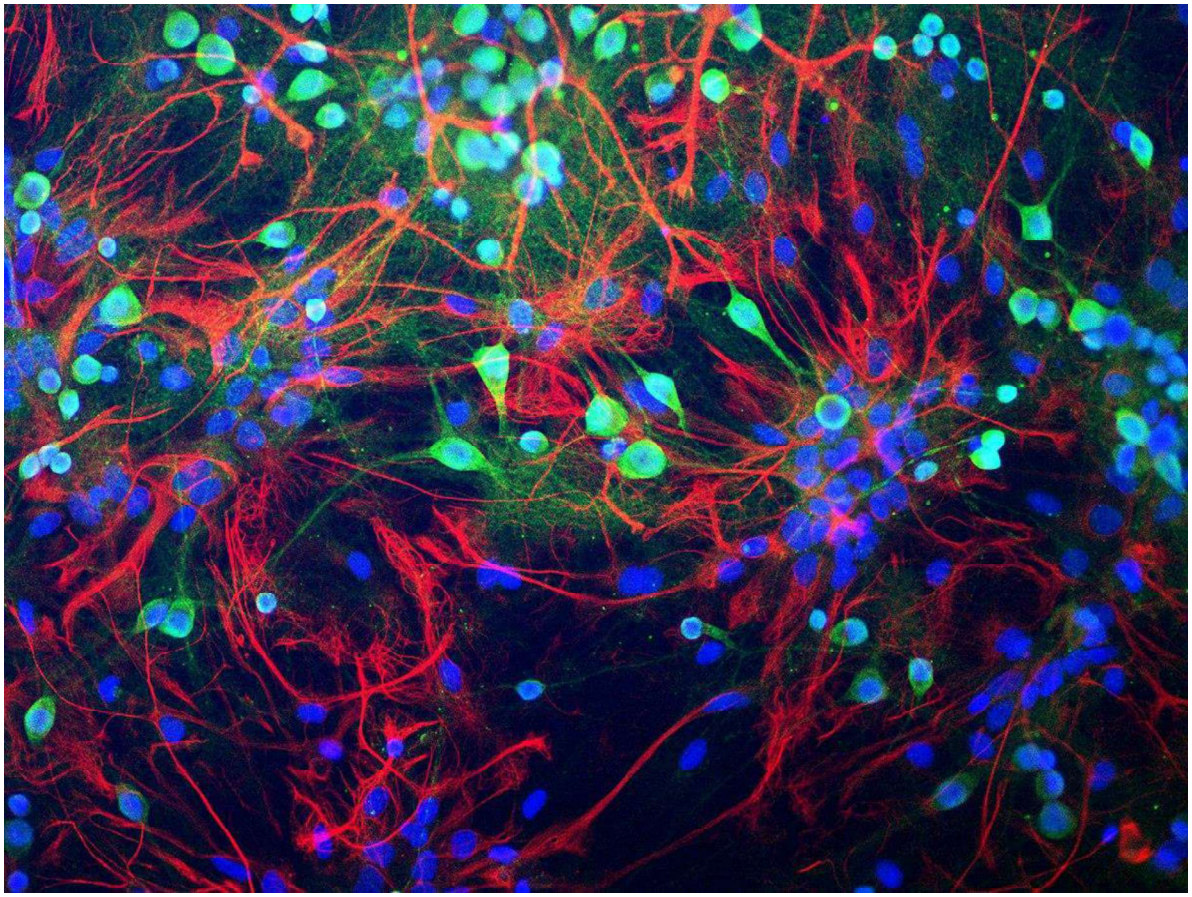
2 EPNEIS als Naturschnittstelle



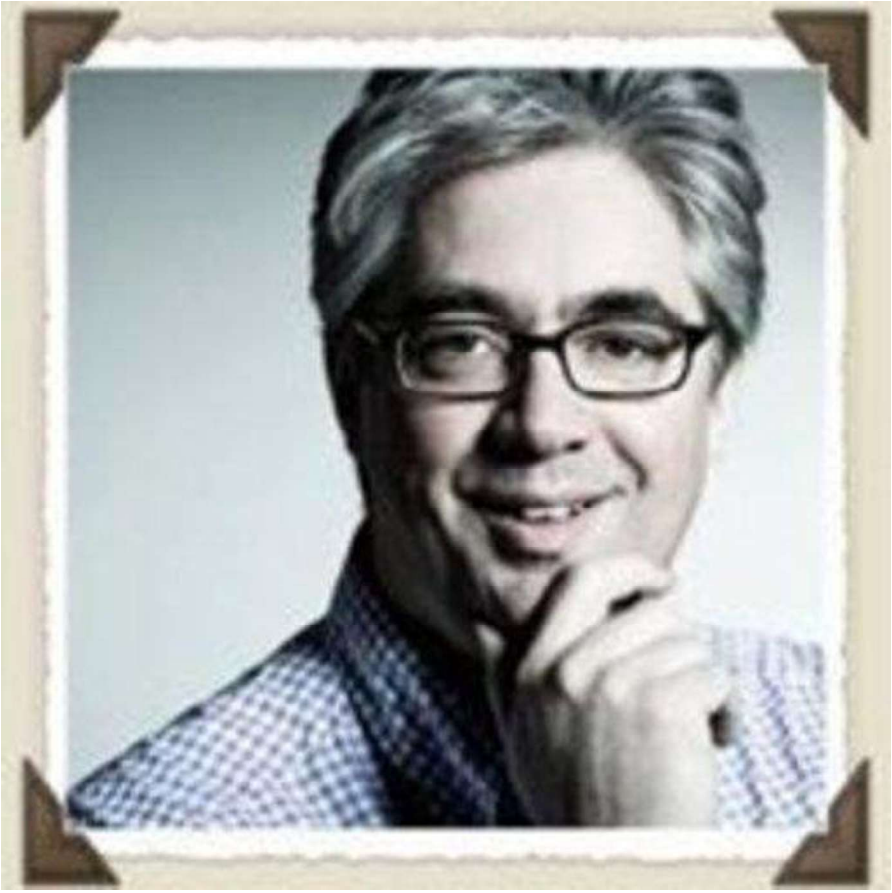
Insgesamt sind die Hypothalamus-Hypophyse, das limbische System und das autonome Nervensystem miteinander verbunden und arbeiten zusammen, um viele physiologische Funktionen zu regulieren, einschließlich Hormonproduktion, Emotionen, Gedächtnis und Körperfunktionen wie Herzfrequenz und Verdauung

2 EPNEIS als Naturschnittstelle

Dr. med., Dipl.-Biol. Clemens Wülfing, University of Hamburg | UHH



https://spotlight.blog/2021/05/01/pnei-vollstandiges-interview-mit-dr-clemens-wulfing-von-der-universitat-hamburg/



https://www.researchgate.net/profile/Clemens-Wuelfing

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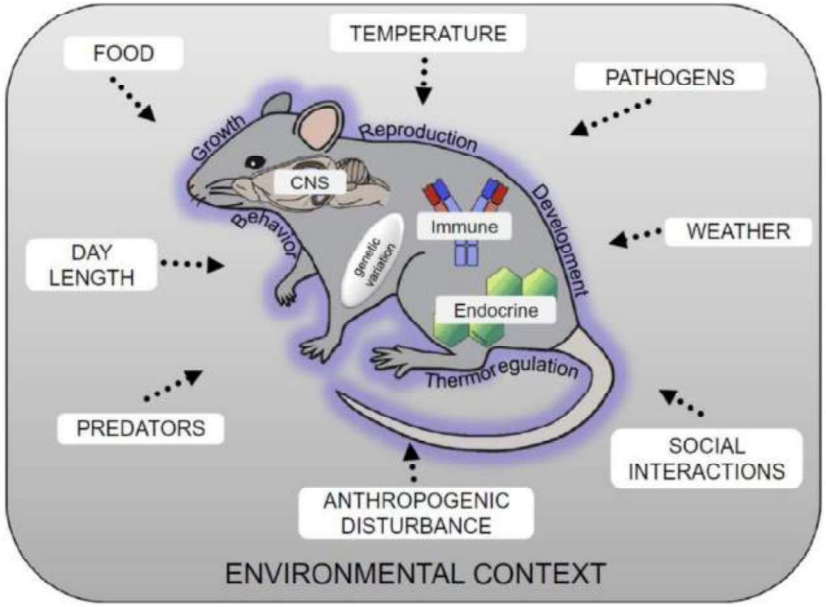
Demas et al 2015

INI-Research

Ecopsychoneuroendokrinoimmunologie

– vielleicht aber auch einfach: „wirklich ganzheitliche Medizin“ –



Graphic model displaying the respective research emphases within the fields of ecoimmunology and psychoneuroimmunology. PNI largely focuses on the interactions of internal physiological systems, represented in the diagram by the traditional laboratory mouse. These systems include, but are not limited to, interactions among the nervous, endocrine and immune systems and their concomitant signaling molecules (e.g., neurotransmitters, neurotropic factors, hormones and cytokines). Also nested within the organism is genetic variability across individuals, which will vary considerably depending on whether the study system is a wild animal or an inbred model organism. In either case, this variability (or lack thereof), has the potential to modify the interactions among the physiological systems. Morphological, physiological, and behavioral outputs from such interactions are represented by the outer "skin" of the mouse, and include what are traditionally considered by ecoimmunologists as phenotypic traits (e.g., reproduction, growth and development, thermoregulation, and behavior). Our hypothetical mouse is nested within a larger environmental context (represented by the surrounding box). Within this context is included select examples from a nearly infinite suite of environmental variables that can range from biotic and abiotic factors, behavioral interactions with conspecifics, and the pathogen environment present in the animal's environmental niche. These environmental factors often vary across time (e.g., seasons, time of day) and space (geographic or population differences) and play an important role as "environmental input signals" to the organism. Lastly, the areas of shading represent the areas of overlap, or lack of overlap, between PNI and ecoimmunology, and serve to highlight key areas where greater integration and synthesis across the fields are needed.

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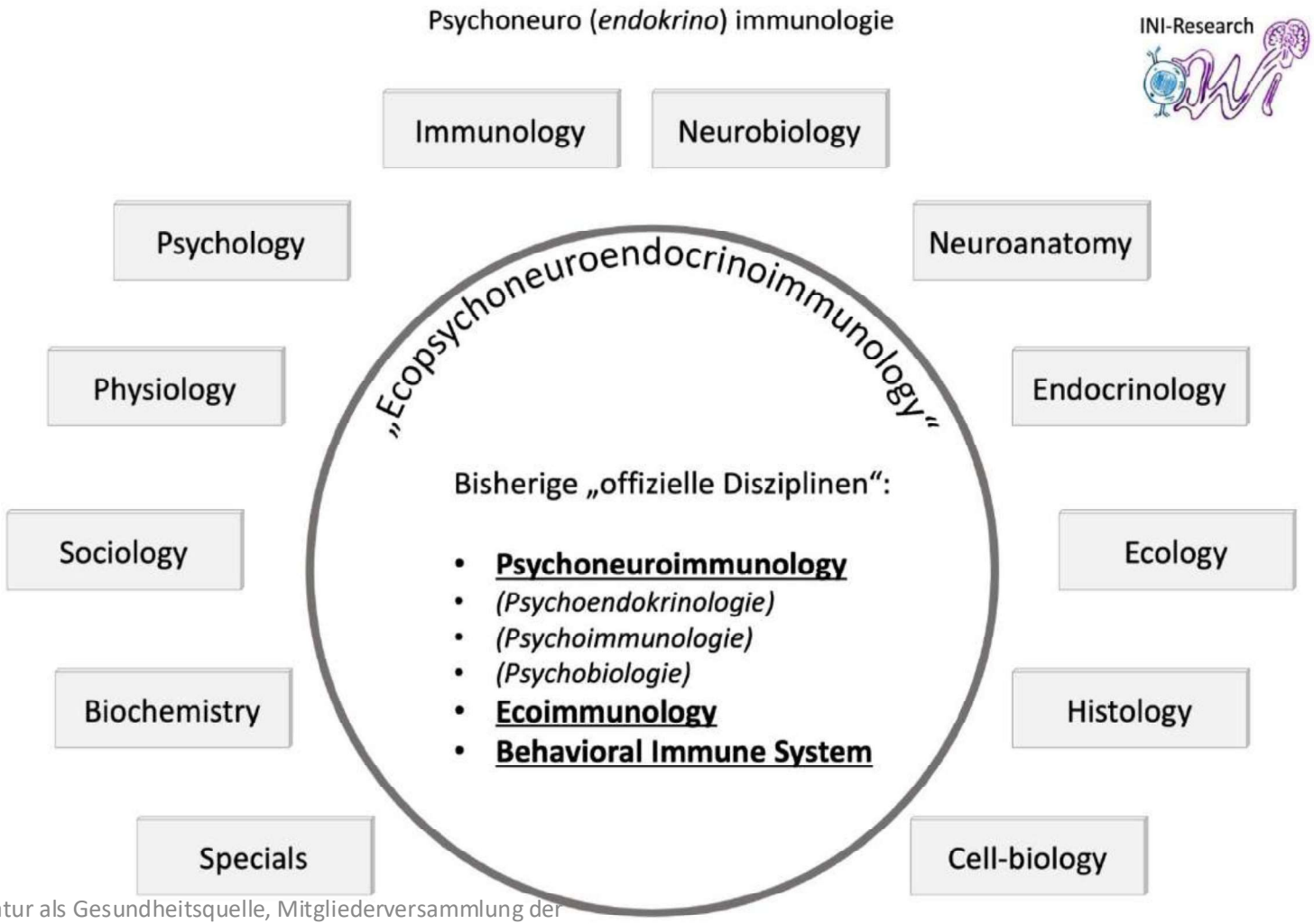
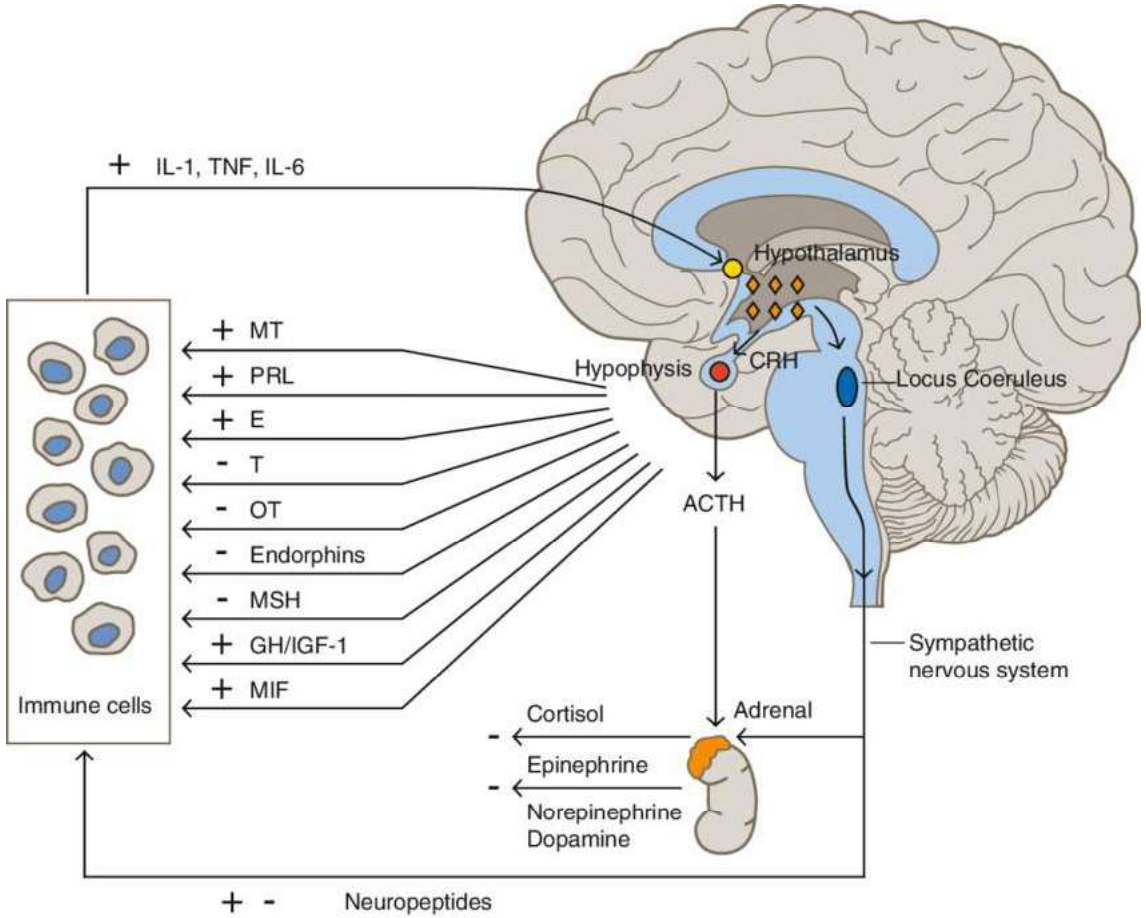
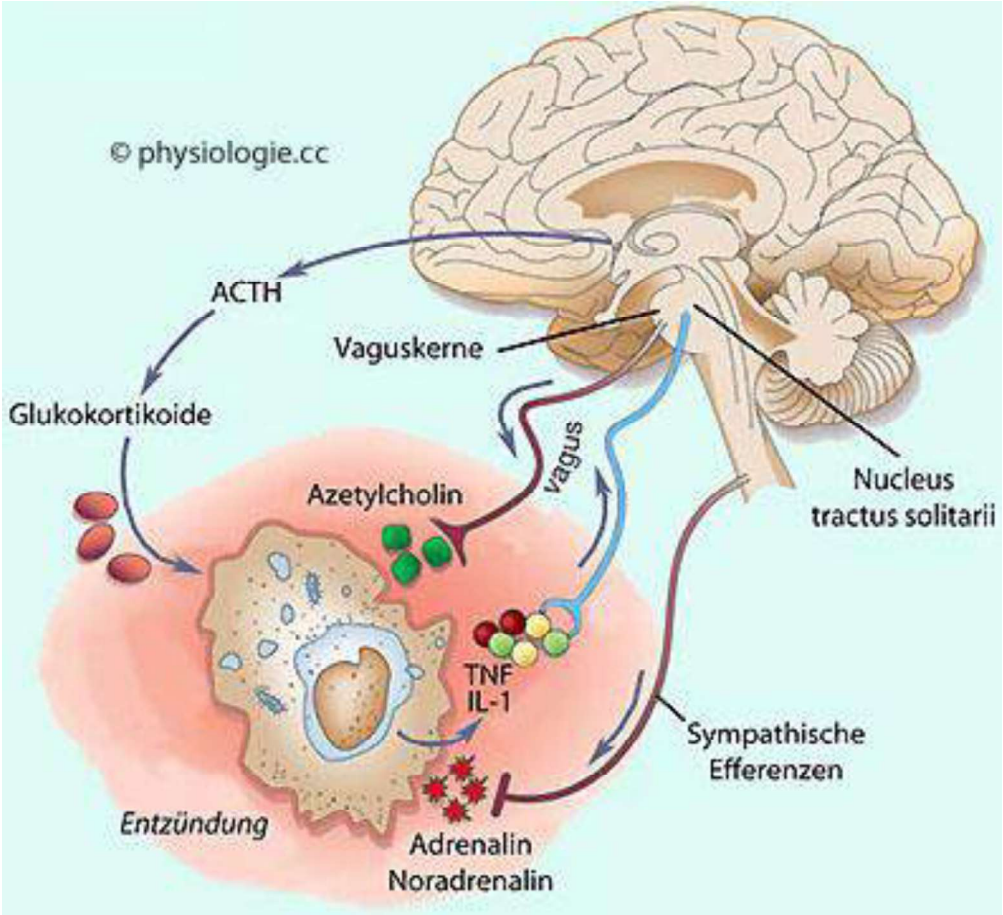
2 EPNEIS als Naturschnittstelle



2 EPNEIS als Naturschnittstelle

Emotionen, ANS, Hormone und Immunität sind zusammenverbunden

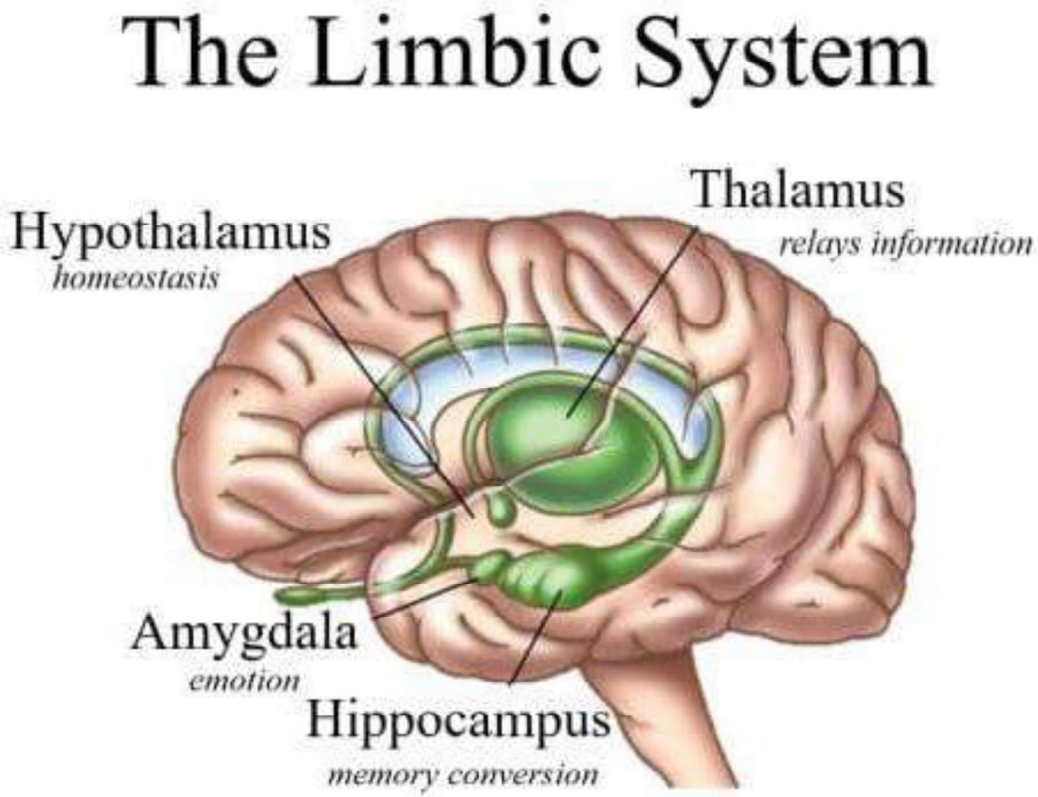


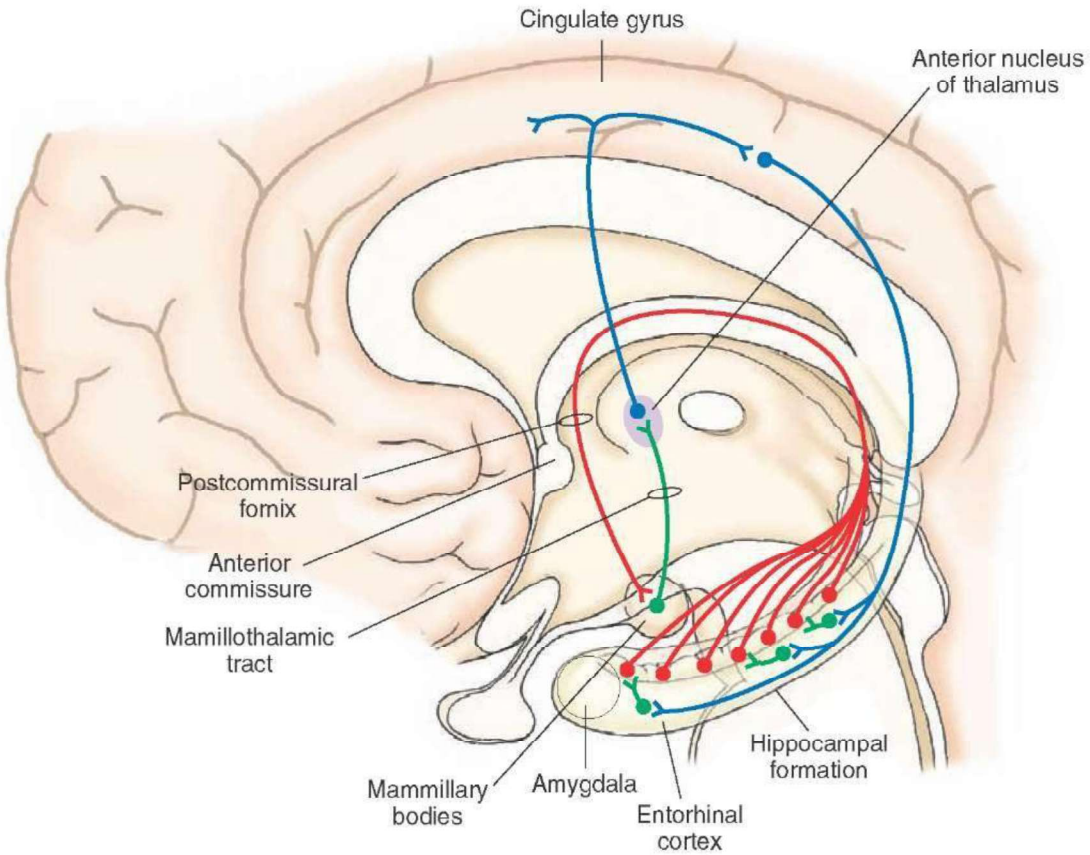


Bottaccioli, F., & Bottaccioli, A. G. (2017). Psycho-neuro-endocrino-immunology paradigm and cardiovascular diseases. *Integrative Cardiology*, 139–151. https://doi.org/10.1007/978-3-319-40010-5_11

2 EPNEIS als Naturschnittstelle

Emotionen, ANS und Hormone sind zusammenverbunden



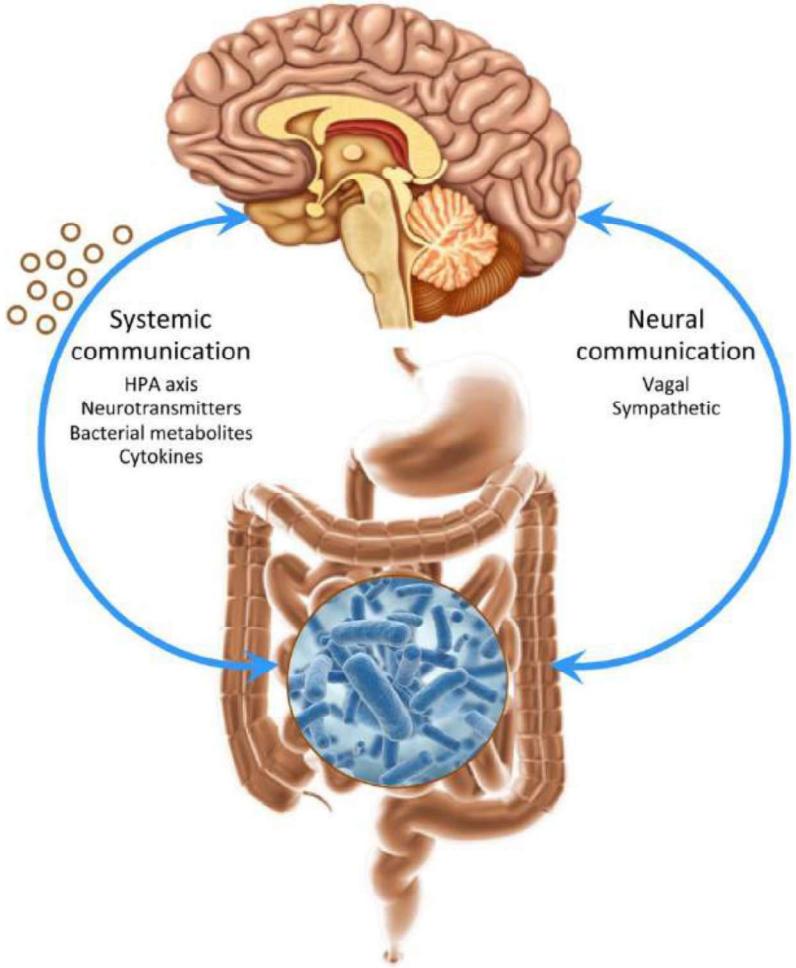


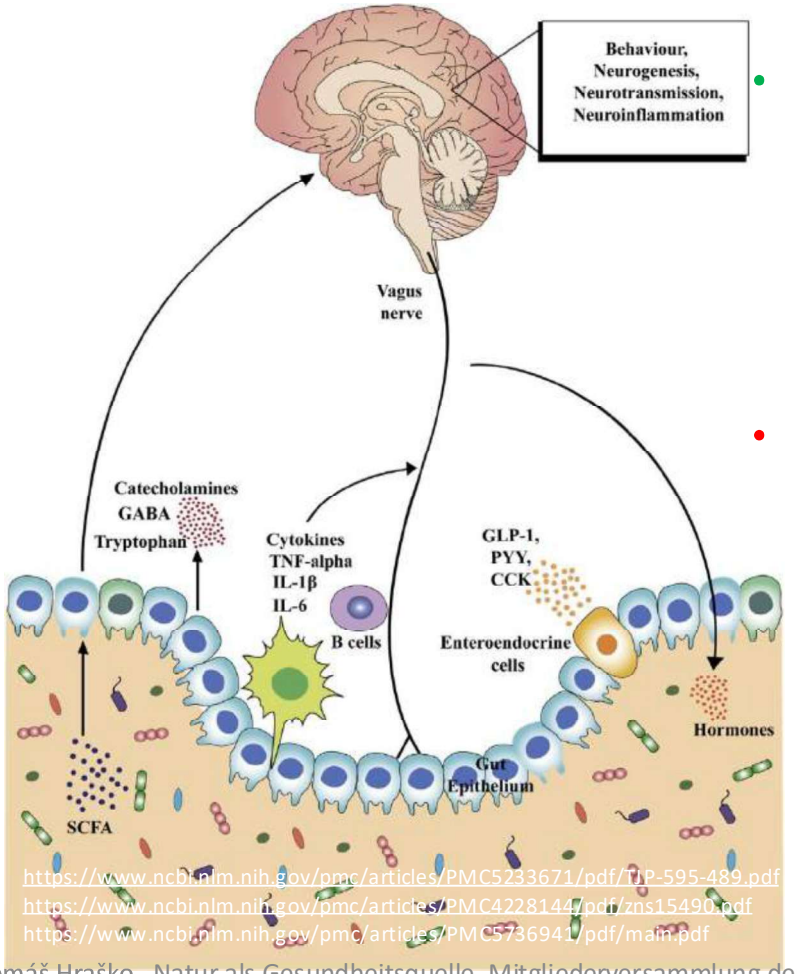
S.H.I.T. Credit to J.Woodall @ dtcw.co.uk, https://fitnash.co.uk/limbic-reactions/

http://what-when-how.com/neuroscience/the-limbic-system-integrative-systems-part-2/

2 EPNEIS als Naturschnittstelle

Bilaterale Kommunikation zwischen Mikrobiom und PNEIS

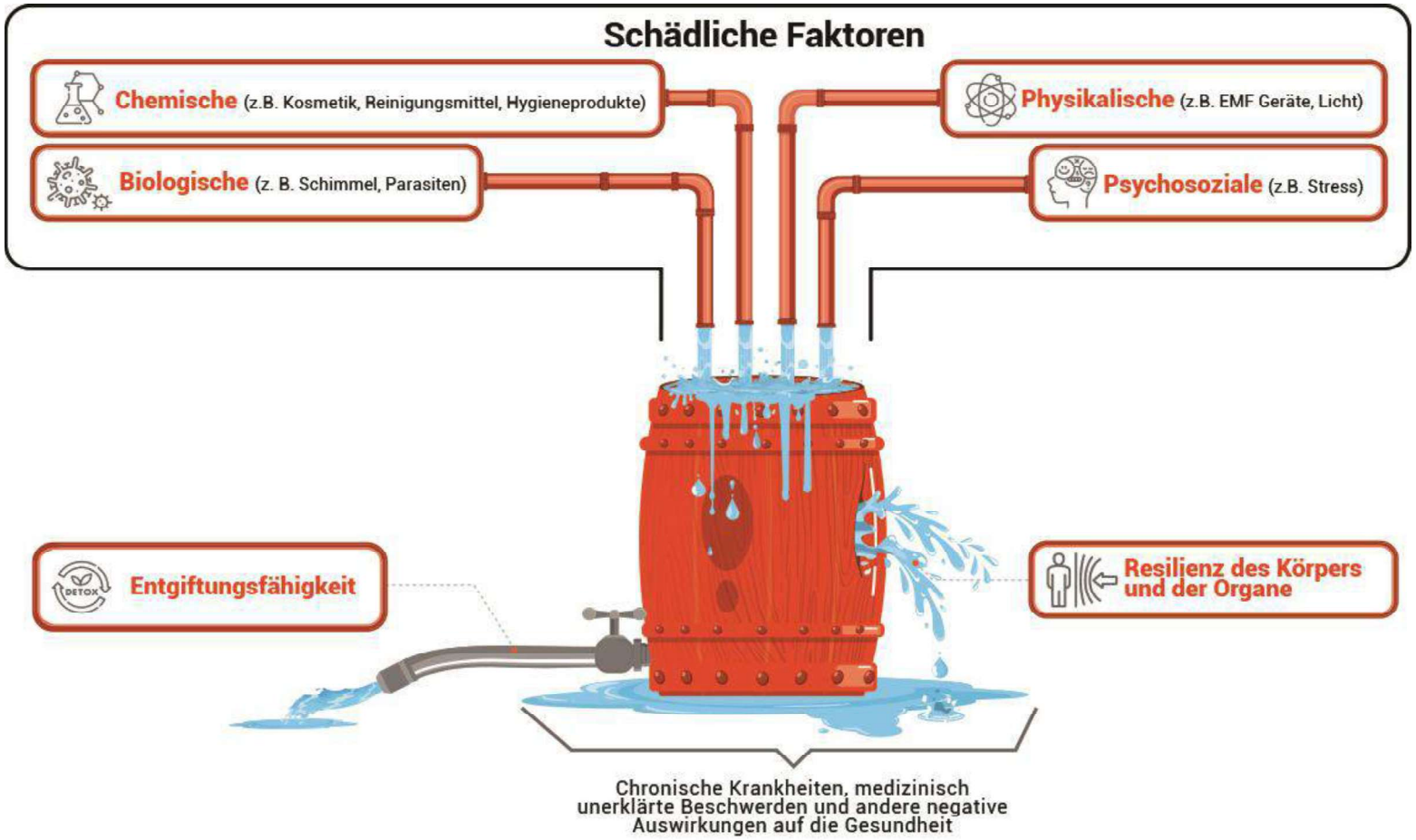




https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5233671/pdf/TJP-595-489.pdf
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4228144/pdf/zns15490.pdf
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5736941/pdf/main.pdf

- Enterisches Nervensystem (ENS) - „zweites Gehirn“ (400-600. Mil. Neurons, Herz zirka 40.000 Neurons). Multiple bilaterale neurokrine und endokrine Signalmechanismen (Darm-Gehirn-Achse).
- Mikrobiom fast 10:1 im Verhältnis zu den menschlichen Zellen

2 EPNEIS als Naturschnittstelle



Nicht eine Belastung allein definiert die Wirkung

- **Sondern die Summe aus:**
  Belastungsumfang / Belastungsdosis

  + Zeitpunkt der Belastung

  + Zeitdauer der Belastung

  + aktueller Vulnerabilität

  + individueller Suszeptibilität

  + aktueller Funktionalität der Detoxifikation

Der Mensch lebt seit über 5 Millionen Jahren in der Natur. Die Physiologie des Menschen ist am besten für eine natürliche Umgebung geeignet.

http://macjamesglobal.blogspot.com/2015/04/most-chemicals-we-use-or-exposed-to.html, https://www.investopedia.com/articles/personal-finance/012315/how-expensive-new-york-city-really.asp, https://roadtohana.com/hawaiian-rainforests.php

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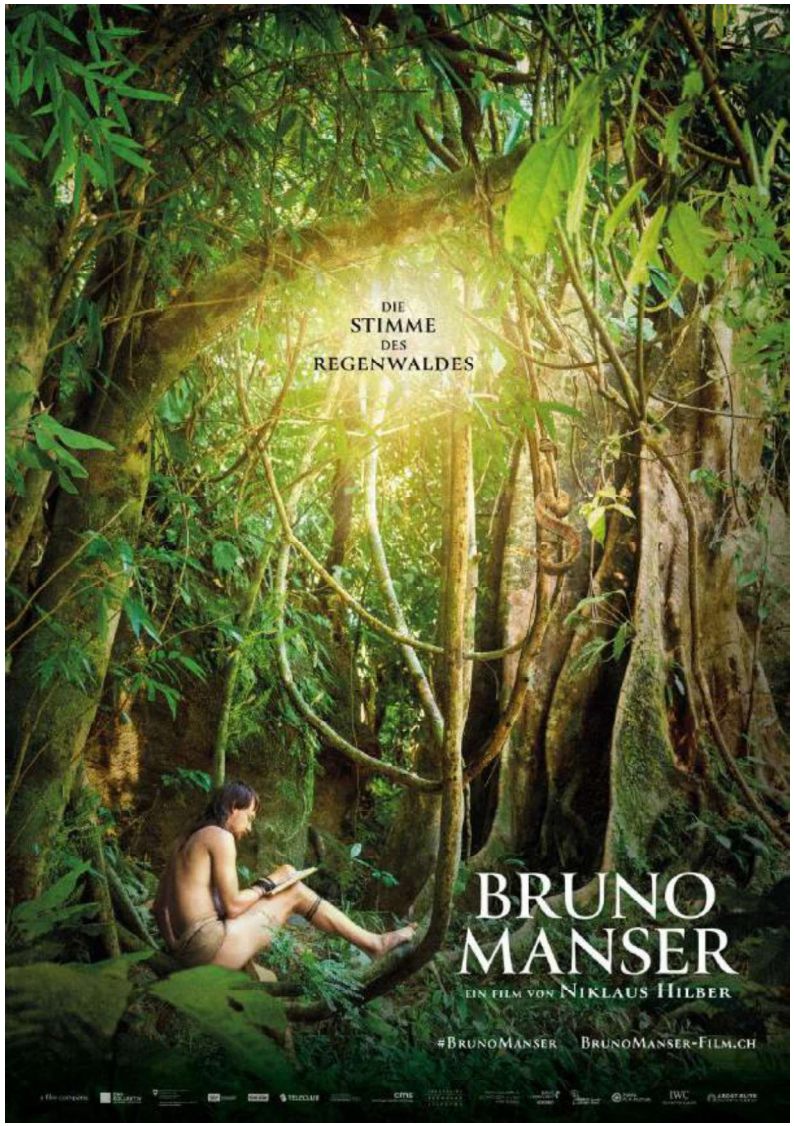
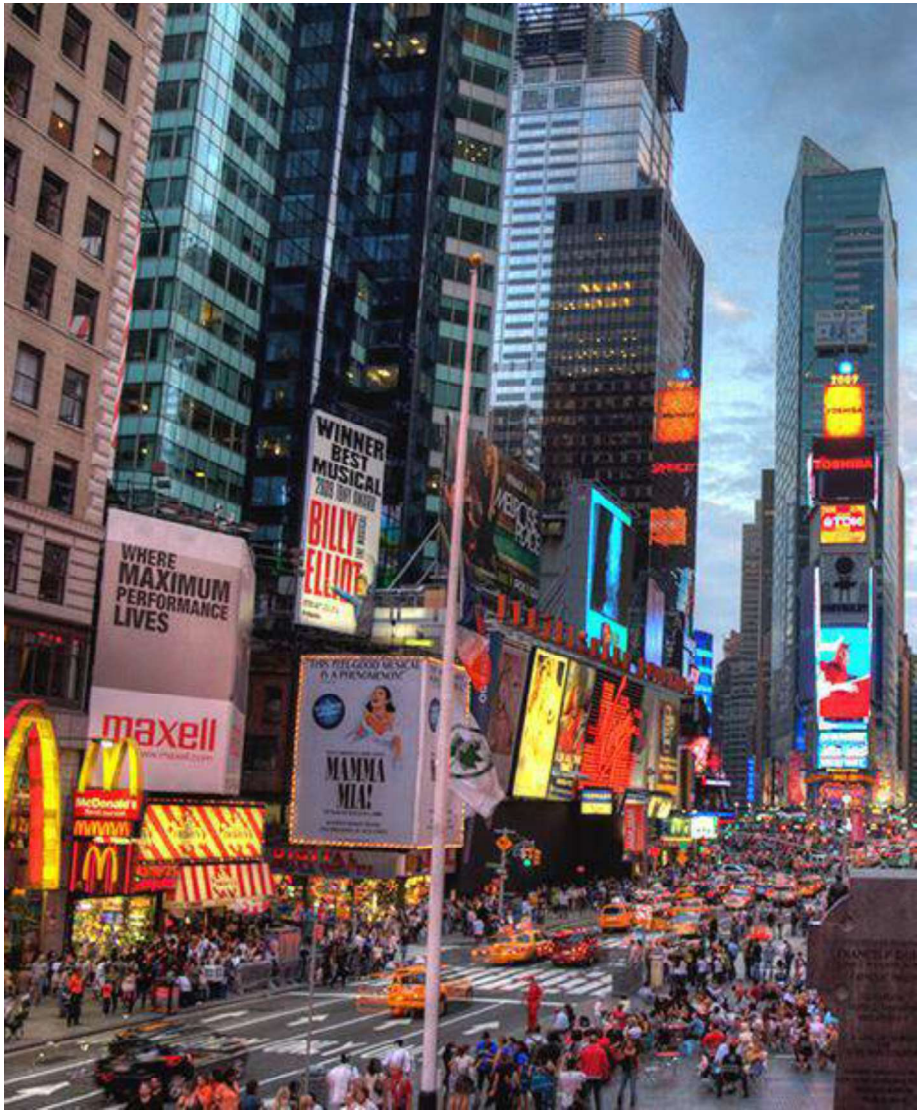
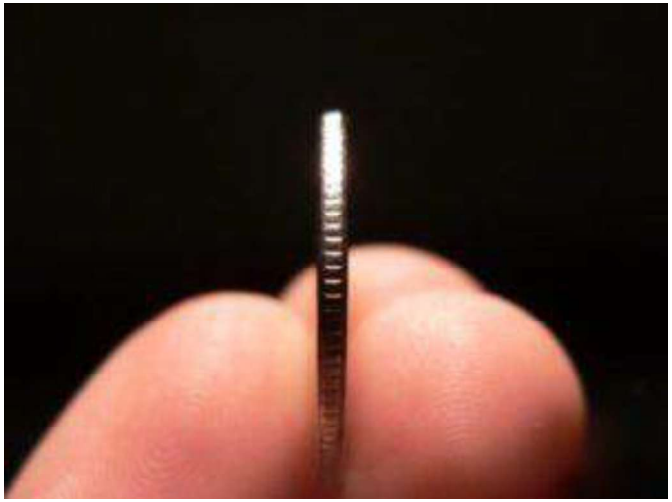




2 EPNEIS als Naturschnittstelle

Der Einfluss der gesunden und schädlichen Umwelt auf die Gesundheit – Problem und Lösung



Alex Grey, Gaia, 1989 https://www.alexgrey.com/art/paintings/soul/alex_grey_gaia-3

2 EPNEIS als Naturschnittstelle

Human genus befindet sich an der Erde zirka 100.000 Genarationen und davon haben wir ausser 500 Genarationen (0.5%) als “hunter-gathers” gelebt.

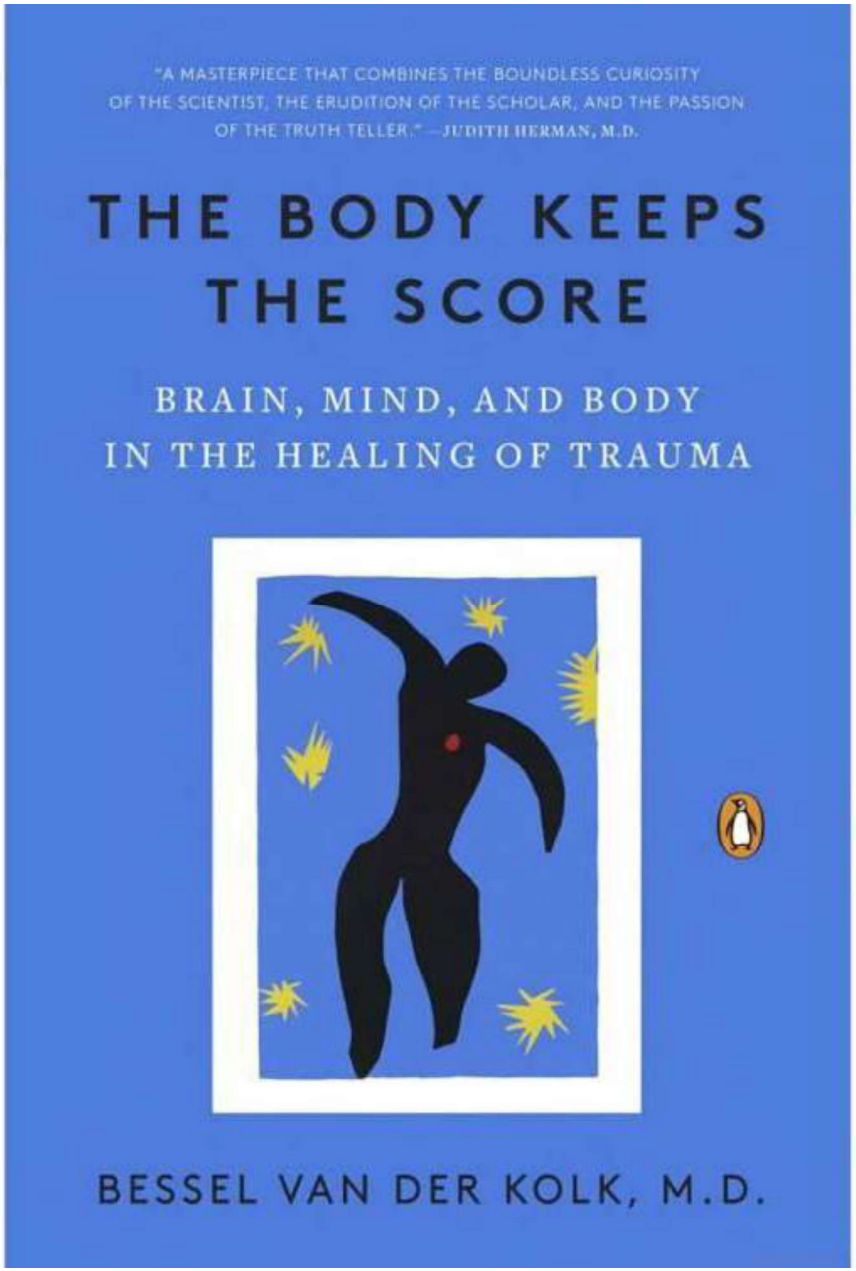
Menschen in den entwickelten Ländern verbringen 90% der Zeit indoors

Quelle: https://www.toddlerfunlearning.com/2018/03/21/children-learn-through-nature/

Quelle: https://www.staracademykids.com.au/technology-affects-childrens-development/

«Flight-or-Fight Reaction» EPNEIS und Stress/PTSD

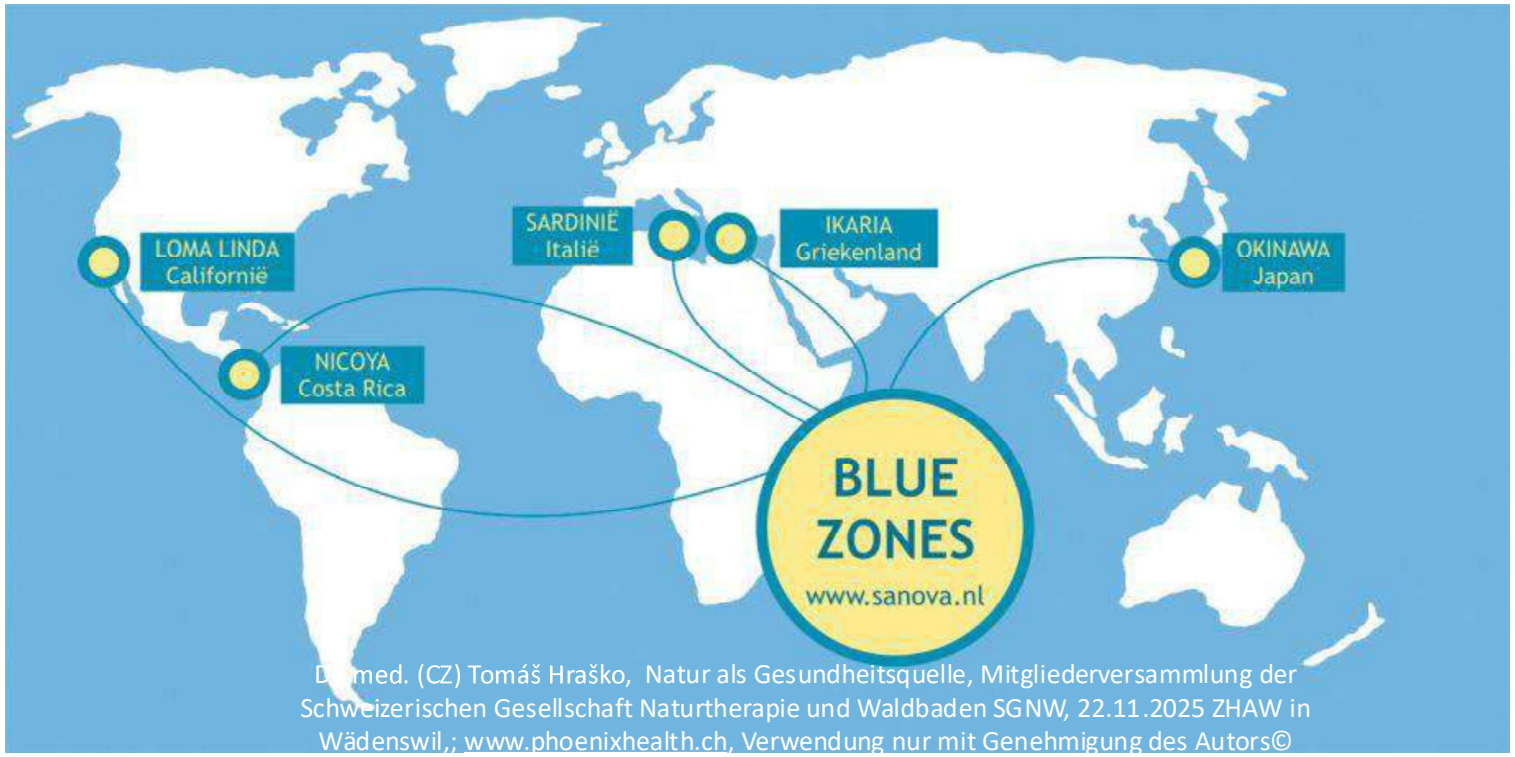
https://mcleanonline.medium.com/fight-or-flight-196fc1beb89f und Google-Pictures Quelle


"A MASTERPIECE THAT COMBINES THE BOUNDLESS CURIOSITY OF THE SCIENTIST, THE ERUDITION OF THE SCHOLAR, AND THE PASSION OF THE TRUTH TELLER." —JUDITH HERMAN, M.D.
THE BODY KEEPS THE SCORE
BRAIN, MIND, AND BODY IN THE HEALING OF TRAUMA
BESSEL VAN DER KOLK, M.D.

2 EPNEIS als Naturschnittstelle

“Blue-Zones”

Blaue Zonen" sind Okinawa in Japan, Sardinien in Italien, die Nicoya-Halbinsel in Costa Rica, Ikaria in Griechenland und Loma Linda in Kalifornien, die einzige blaue Zone in den Vereinigten Staaten. Menschen, die in den blauen Zonen leben, werden zehnmal so häufig 100 Jahre alt als diejenigen ausserhalb von diesen Zonen.



D med. (CZ) Tomáš Hraško, Natur als Gesundheitsquelle, Mitgliederversammlung der Schweizerischen Gesellschaft Naturtherapie und Waldbaden SGNW, 22.11.2025 ZHAW in Wädenswil,; www.phoenixhealth.ch, Verwendung nur mit Genehmigung des Autors©

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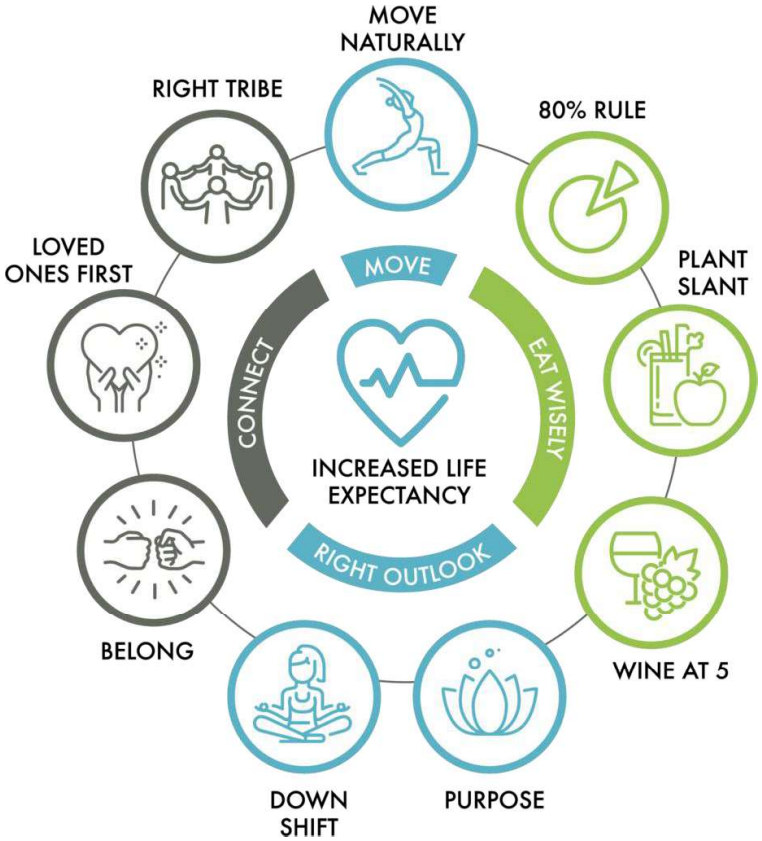
https://gethealthyu.com/blue-zone-foods-for-longevity/



https://fountaingateli.org/blue-zone-inspired-living-for-longevity/

Thompson R. Gardening for health: a regular dose of gardening. Clin Med (Lond). 2018 Jun;18(3):201-205. doi: 10.7861/clinmedicine.18-3-201. PMID: 29858428; PMCID: PMC6334070.

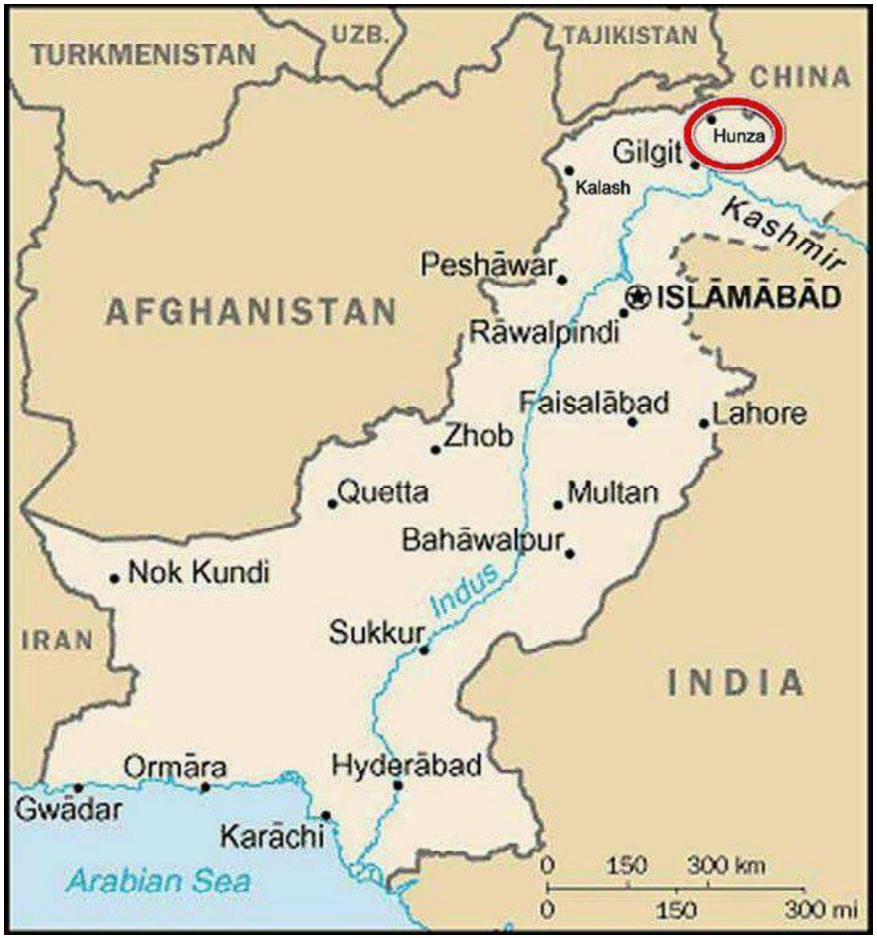
2 EPNEIS als Naturschnittstelle

Das Volk der Himba in Namibia (Aborigines – Urvölker in der Natur)

https://www.youtube.com/watch?v=7NKxGhgibAI, https://www.flickr.com/photos/91886395@N04/32868127843

2 EPNEIS als Naturschnittstelle

Die erstaunlichen Hunzakuts in Hunza Valley Karakorum Berge in Pakistan

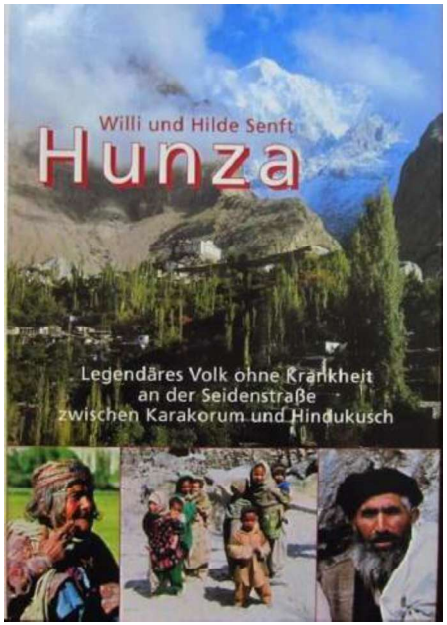


Source Google-Pictures

2 EPNEIS als Naturschnittstelle

Die erstaunlichen Hunzakuts in Hunza Valley Karakorum Berge in Pakistan

Alle Forscher, die mit dem Hunza-Stamm gelebt und ihn studiert haben, kamen fast zum gleichen Ergebnis, nämlich dass das lange und gesunde Leben der Hunza-Bewohner auf ihre "organische und natürliche Lebensweise" zurückzuführen ist. Dazu ist anzumerken, dass die Ernährung der Hunza-Bewohner hauptsächlich aus biologischem Rohgemüse und Obst mit geringem Proteingehalt besteht. Auch Wasser ist einer der Schlüsselfaktoren für die Langlebigkeit der Bewohner.
Neben ihrer Ernährung spielt auch ihre harte Arbeit eine wichtige Rolle bei der Erhaltung ihrer Gesundheit.



Quelle: https://zeenews.india.com/photos/world/happiest-healthiest-people-on-this-planet-curious-case-of-hunza-tribe-2357101/hunza-tribe-has-been-the-topic-of-several-researches-2357107

Heilende Kraft der Natur und Wissenschaft

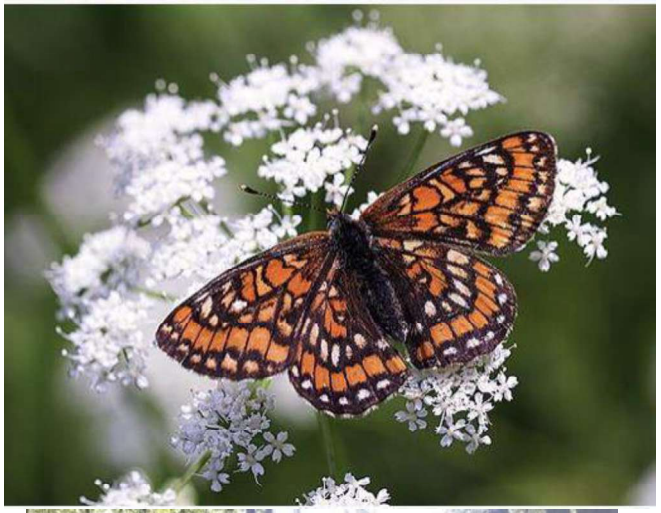
Waldbaden

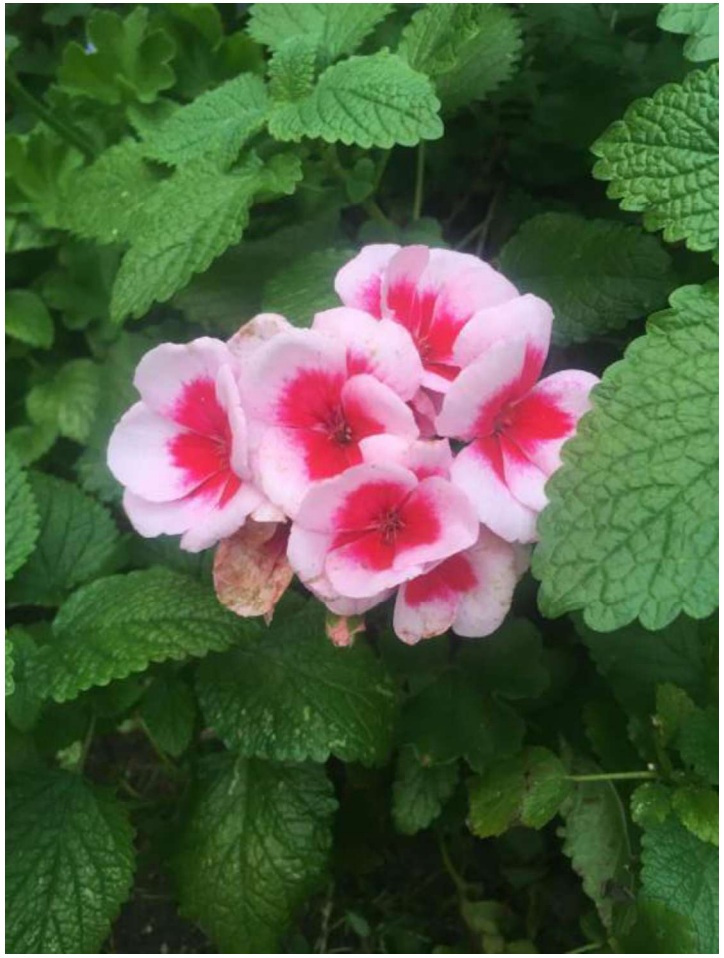
Sonne und Wärme

Earthing & Grounding

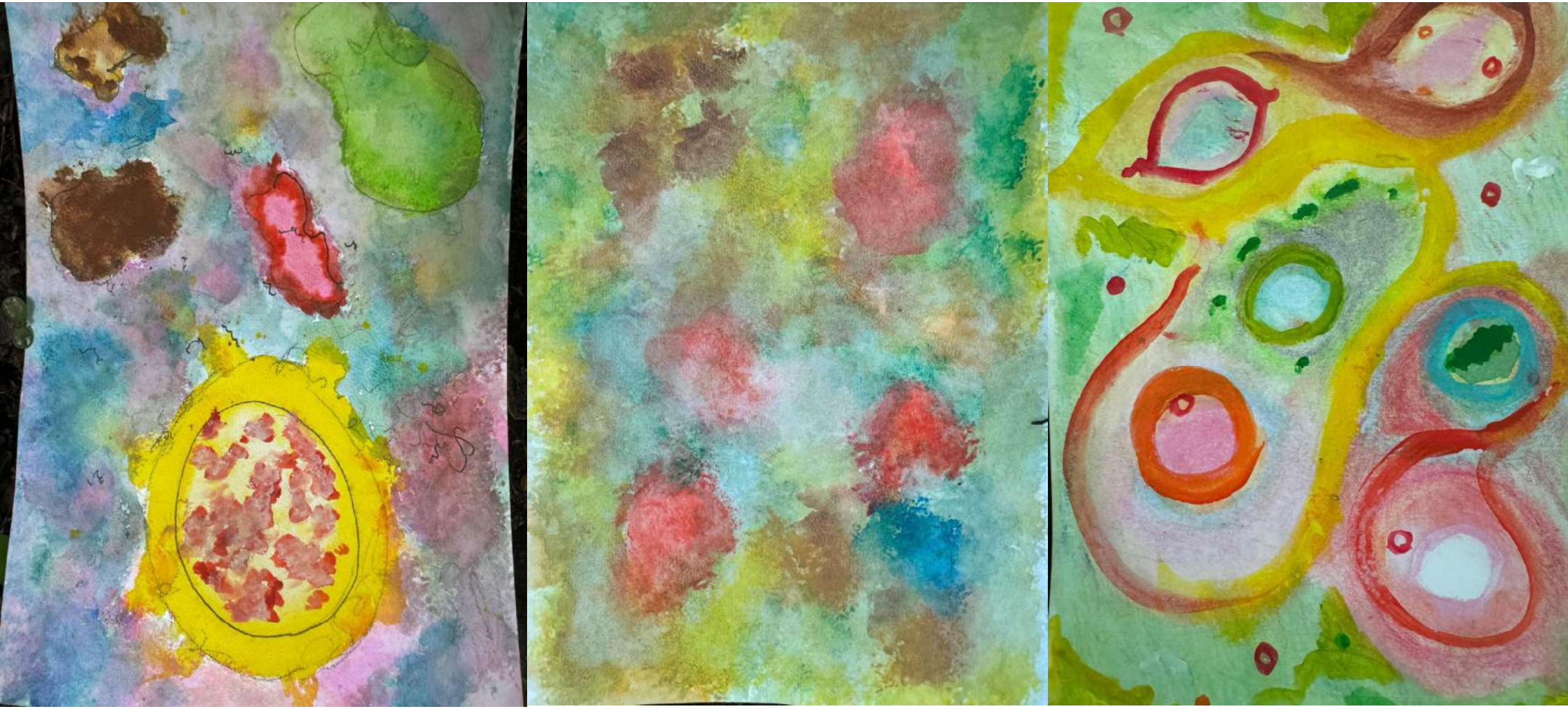
HOW FORESTS HEAL PEOPLE

3 Waldbaden als Gesundheitsquelle





3 Waldbaden als Gesundheitsquelle



3.1 Was ist das Waldbaden?

✓ Shinrin-Yoku, Waldbaden 1980s

Methode: ein langsames zirka 3-4h (1500m) dauerndes Wandern im Wald. Eine natürliche Aromatherapie. Verbindung mit der Natur und mit Ihrem Körper durch Ihre alle Sinne. Zertifizierte Waldbaden-Stationen und Wälder. Zusätzliche Aktivitäten (Malen, Keramik, Holzarbeit).

Mission: die Verbesserung der Gesundheit der (japanischen) Population als Reaktion auf den Technostress und Überarbeit in den japanischen Städten (*Karōshi*). Prof. Qing Li, PhD (Yakushima Insel).

✓ ANTF - The Association of Nature and Forest Therapy, der Verein für Natur- und Waldtherapie, 2012s

Methode: Standard Sequence. Das Ziel beim Waldbaden ist "hier", nicht "dort". Das Tempo ist langsam, nicht schnell. Der Schwerpunkt liegt auf Verbindung und Beziehung. Der Wald ist der Therapeut. Der Führer öffnet die Türen. Das Hauptziel der Waldtherapie besteht darin, das Wohlbefinden und die Gesundheit der Teilnehmer durch geführte, intensive Erfahrungen in Wäldern und anderen natürlichen Umgebungen zu fördern.

Mission: ANFT ist eine missionsorientierte Gesellschaft, die 2012 als Reaktion auf die Umweltkatastrophen gegründet wurde. Als Ziel hat ANFT die Gesundheit des Planeten zu unterstützen, indem man herzzentrierte Beziehungen zwischen allen Völkern und der Natur pflegt. ANFT ist der erfahrenste Weltmarktführer in der Ausbildung von Waldtherapieführern. CEO Amos Clifford.

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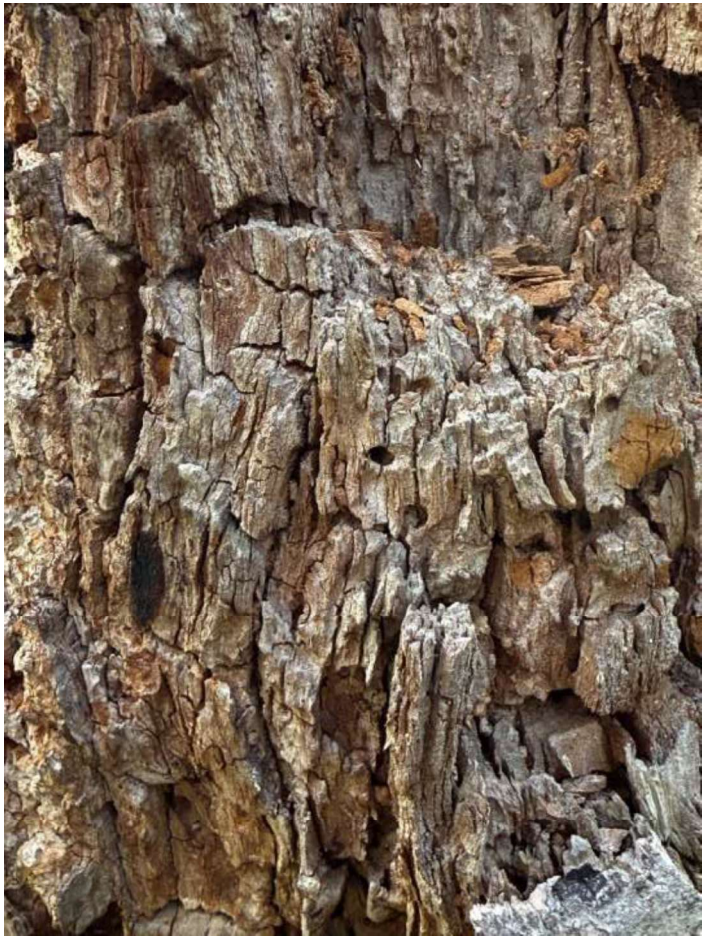
en
viddsee.com
A Viddsee Original
Voices: In Between
A Natural Appeal

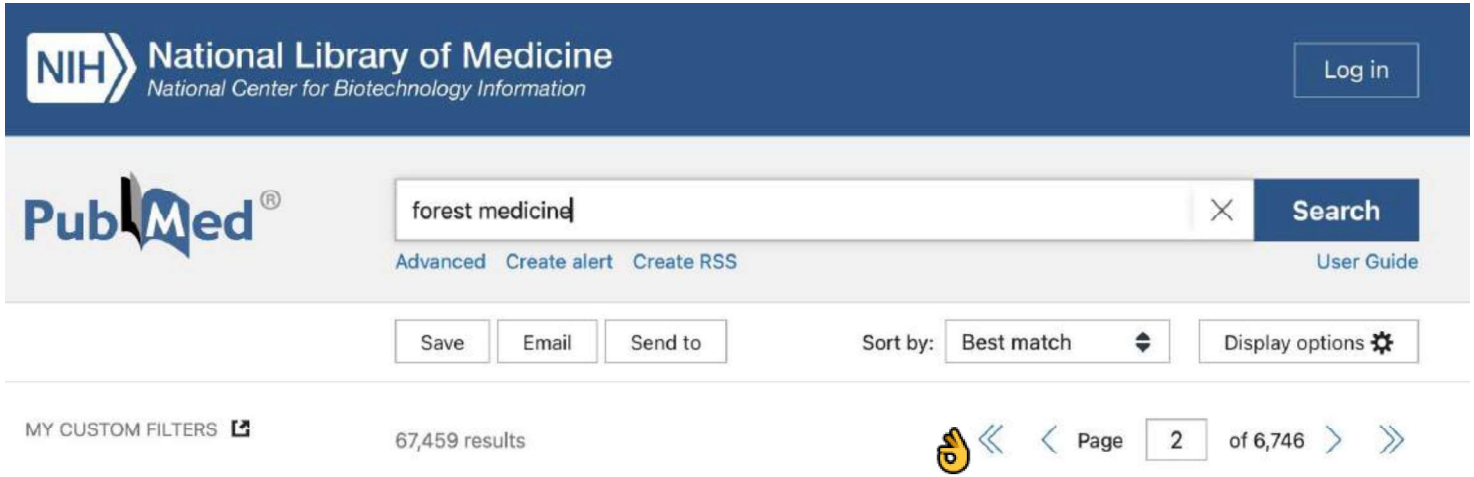


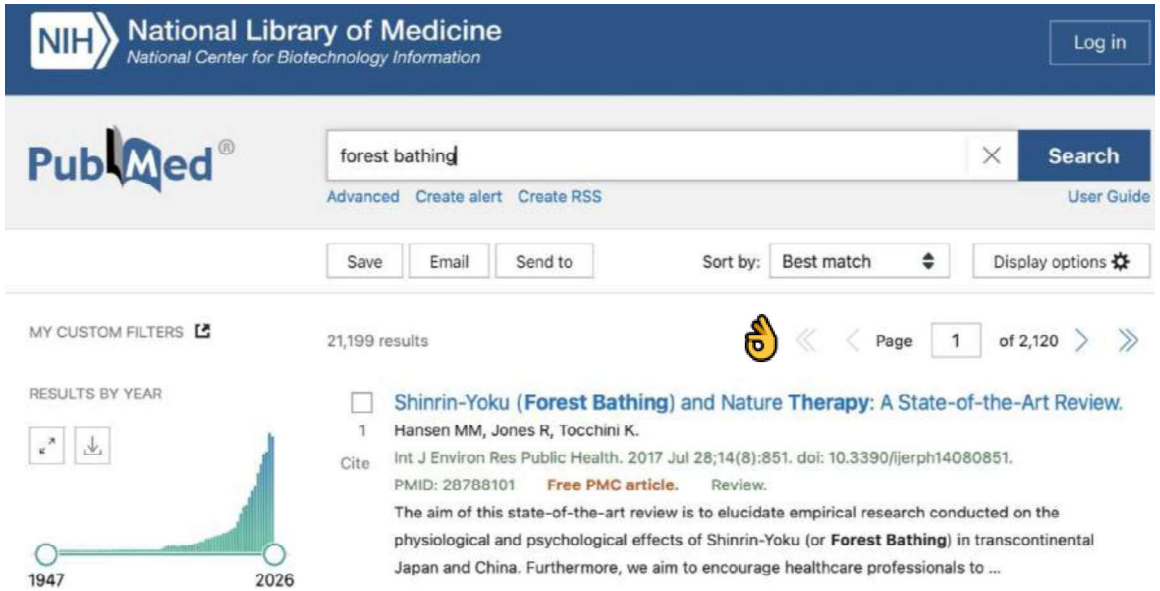
3.2 Wie kann das Waldbaden Ihre Gesundheit effektiv fördern?

- Wissenschaftliche Basis - Pioneer Prof. Qing Li, PhD, Tokyo-Japan
- Grundprinzip: die menschliche Physiologie an die Natur seit Millionen Jahren angepasst.
- Fördert psychisch und körperlich.

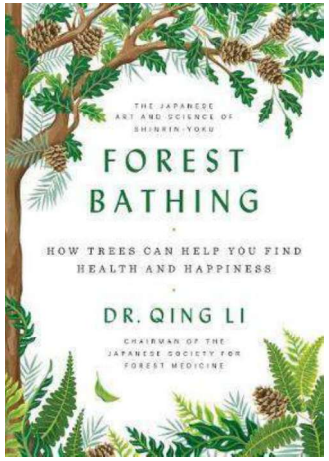
Welche Auswirkung hat der Wald auf Ihre Gesundheit?

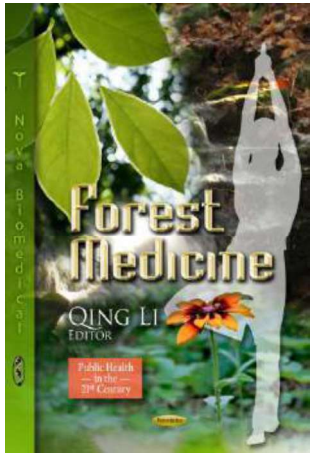
3.2 Wie kann das Waldbaden Ihre Gesundheit effektiv fördern?

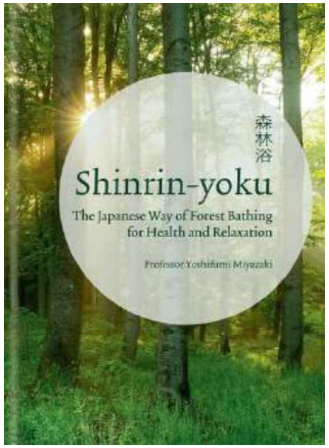


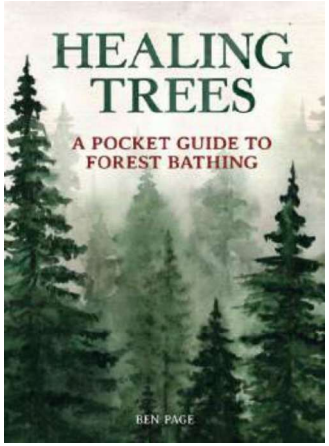


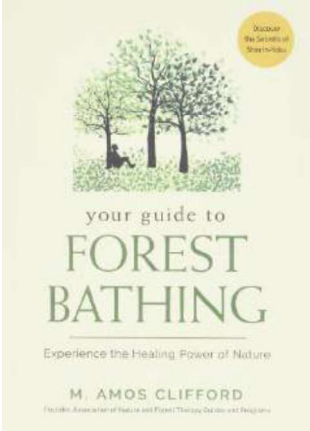
3.2 Wie kann das Waldbaden Ihre Gesundheit effektiv fördern?

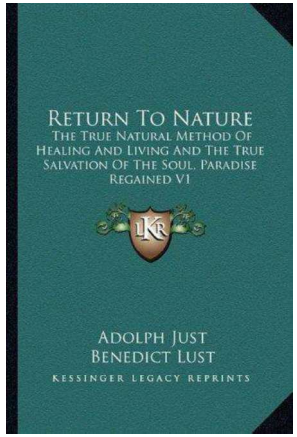












“The art of healing comes from nature, not from the physician”
Swiss-German physician, Paracelsus,

3.2 Wie kann das Waldbaden Ihre Gesundheit effektiv fördern?

1 Immunsystem Modulation und Wundheilung

Reduktion der Aktivität der **silent inflammation** (NF-ϰB, TNFa, iNOS) – Wald Mikrobiom und negative Ionen[1-4, 6, 7]

- **Antikanzeröse** Effekte (**NK**)[1-4, 6]
- Asthma bronchiale, atopische dermatitis und Allergien[1, 6]

2 Verbesserung der Laune, Konzentration und Gehirngesundheit

- **Schlafqualität** verbessert, Ruhe[1, 2, 7-8]
- Verbesserung der **kognitiven Funktion** (neuroprotektiv Nrf2, ROS, CB2)[1, 2,4, 6] Motivation und Fokus (inc. ADHS)[1, 5, 6]
- Stress Resilienz (**Parasympatikus**)[1-4, 6] und mehr Energie[1, 2, 6]
- Angst-Störung (grüne Farbe, Terpene), Burn-Out und Depression[1, 2, 4, 6]
- Energie-Vitalität, Freude und das Leben macht Sinn (negative Ionen, Enkefalins, grüne Farbe)[1, 2, 5, 7]

3.2 Wie kann das Waldbaden Ihre Gesundheit effektiv fördern?

3 Kardiovaskuläre Gesundheit

- **Blutdruck** Senkung (ACE-AngII, NO, HHN-Achse (Cortisol, DHEAS), ANS), heart rate variability (HRV)[1, 2, 3, 7]
- Reduktion der all-cause mortaility (ACM) = anti-aging effects[1, 4]
- Durchblutung[1, 7]

4 Stoffwechsel Optimierung

- **Insulinsensitivität** verbessert[1, 2]
- Gewichtsreduktion (Stress Abbau, Optimierung der HHN Achsen, Adiponectin)[1, 4]

5 **Schmerzlinderung**

- **Grüne Farbe, Enkefaline und beta Endorphine** (Opioide)[5, 7]

Literatur im Appendix

3.2 Wie kann das Waldbaden Ihre Gesundheit effektiv fördern?

Wissenschaftlich fundierter Ansatz.

Fördert die Gesundheit körperlich (Immunsystem, Herzkreislaufsystem, Stoffwechsel) sowie psychisch (Vitalität, Laune, Selbstermächtigung).

Prävention und Anti-aging fördernd

Aktiviert den Vagus (HRV-Variabilität) und damit Selbheilungsprozesse.

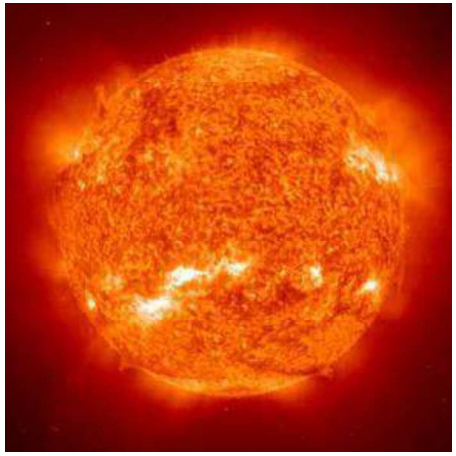
Harmonie und Verbindung zwischen dem Mensch und der Natur.

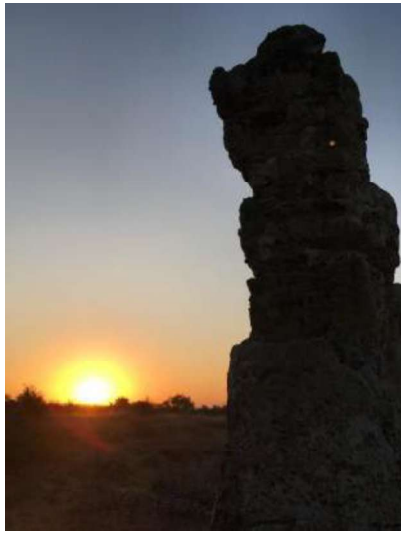
Verbindet West und Ost Philosophie (Europa, Asien).

FOREST
SCENIC SCENES FILM 4K

3.3 Sonne und Wärme als Gesundheitsquelle

Go Outside. You **Cannot** Supplement For The Sun!





https://science.howstuffworks.com/sun.html, https://www.bbc.co.uk/programmes/b048nlfb

https://www.memphistours.com/egypt/egypt-wikis/egypt-pyramids/wiki/pyramids

3.3 Sonne und Wärme als Gesundheitsquelle

1 Immunsystem Modulation

- **Stärkt Immunsystem** und positiven Einfluss auf die Autoimmunerkrankungen (MS, Psoriasis, Typ 1 Diabetes mellitus, RA, SLE), **Tumore** (Prostata, Mamma, Ovarien, Vesica, Pankreas, NHL, Melanome - aMSH)[1]
- Erhöht Vitamin D Spiegel, Einfluss auf die **Endocannabinoids Spiegel und Melatonin-Spiegel**[1, 4, 10, 12]
- Positiven Einfluss auf die **mitochondriale Funktion** (unter anderem via VDR, Nrf2)[8, 9, 12-13]

2 Zirkadiane Zyklen

- Tractus Retinohypothalamicus (RHT): (intrincically photosensitive retinal ganglion cells (ipRGC) und Suprachiasmiatic nucleus (SCN) und Glandula pinealis (melatonin)[1, 5-7, 10, 12]
- Schlafqualität und Energie – Level (**Cortisol-Melatonin Entrainment**), Premens-Syndrom (Hypothalamsu-Hypophysäre Achse) = 15-30 Minuten Sonne Kontakt morgen früh[1-7, 10, 12]

3 Verbessert die Laune und Energie-Level

- Erhöht die **Beta Endorphine** Produktion (in den Keratonyozyten sowie zentral via alpha MSH) und Orexin A/Hypocretin 1 Produktion (Hypothalamus) – **Orexin Effekt** auf Körpertemperatur, Gewichtsverlust, erhöhte **Aufmerksamkeit und Wachheit** [1-4, 10]
- Anxiolytische und antidepressive Wirkung - aaisonale Depression (seasonal affective disorder SAD), bipolare Störung (Serotonin, Dopamin – striatal D2/D3 density)[1, 10]

3.3 Sonne und Wärme als Gesundheitsquelle

4 Reduziert Schmerzen und Knochen-Qualität

- Effekt auf die Osteoporosis, Osteomalazia, Rachitis und Fibromyalgie (beta Endorphine, Endocannabionoiden, aMSH) und Muskeltonus Relaxation[1, 2, 4]
- Orale Dysbiosis und **Karies-Risk-Reduktion**[1]

5 Wakefullnes und neurodegenerative Erkrankungen Prävention

- Malatonin, VDR, Orexin A[2-7, 11, 12]
- Neurogenese Förderung und neurodegenerative Erkrankungen Prävention: Brain derived neurotrophic factor (BDNF) levels im Gehirn und nerve growth factors (NGF) im Haut, alpha MSH[1, 2]

6 Kardiovaskuläre Gesudheit und bessere Potenz-Libido

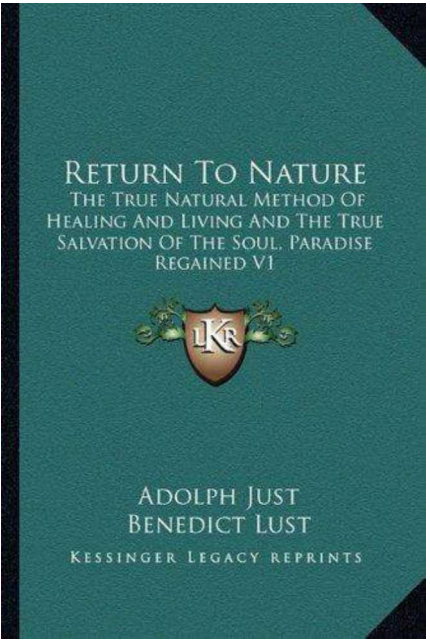
- Die Sonne und UV Strahlung erhöht Vitamin D Spiegel und **erhöht die NO Spiegel im Blut –** antihypertensive und vasodilatative Wirkung und reduziert ACE Aktivität, **Testosteron-Synthese**[1, 8, 14]

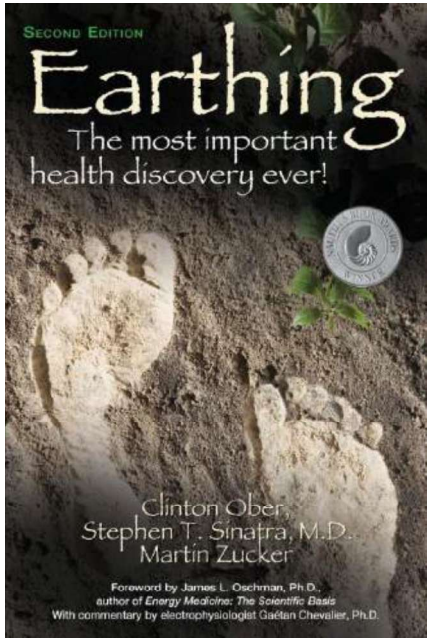
7 Gewichtreduktion und metabolische Gesundheit

- Induktion des "**browning**" (WAT ➤BAT)[1]
- Verbesserung der Insulinsensitivität, NAFLD Prävention (VDR, Nfr2)[1, 8]
- Alpha MSH und Orexin (hypocretin 1) **Sättigungsgefühl**[1, 11, 14]

Literatur im Appendix

3.4 Earthing & Grounding als Gesundheitsquelle





Zurück zu den Wurzeln

3.4 Earthing & Grounding als Gesundheitsquelle

1 Immunsystem Modulation

- **Reduktion der Aktivität der silent inflammation, antioxidateive Wirkung**[1-3 8]
- Boden Mikrobiom und negative Ionen[1,3, 8]
- Autoimmunerkrankungen?[2, 3, 8]

2 Verbesserung der Laune, Konzentration und Gehirngesundheit

- Schlafqualität verbessert und **zirkadiane Rhytmen** stabilisiert (Cortisol-Melatonin, Schumann-Resonanz) – Premens-Syndrom, Jet lag[1,3, 8]
- Verbesserung der **kognitiven Funktion** (EEG△)[1, 2] Stress Resilienz (Parasympatikus)[1, 2, 8]
- Angst-Störung, Burn-Out und Depression[1, 2, 8]
- Energie (ATP Produktion und Proteosynthesis durch e^-), Freude und das Leben macht Sinn (negative Ionen, Enkefalins)[1, 8]

3 Kardiovaskuläre Gesundheit

- **Blutdruck Senkung** (HHN-Achse-Cortisol, DHEAS, Optimierung des ANS), heart rate variability (HRV)[1,2, 5, 7, 8]
- Durchblutung und Erektion-Libido[1, 2, 8]
- Antiarhytmische Wirkung[5, 8]
- **Antithrombotische Wirkung, Blutviskosität reduziert**[1, 2, 8]

3.4 Earthing & Grounding als Gesundheitsquelle

4 Stoffwechsel Optimierung

- **Insulinsensitivität verbessert** (Stress Abbau, Optimierung der HHN Achsen, höhere HRV)[1, 2, 4, 8]

5 Schmerzlinderung und Wundheilung

- **DOMS (delayed onset muscle soreness)** und Fibromyalgie, Relaxation (EMG, EEG)[1, 2, 8]
- Schnellere **Wundheilung**[1, 2, 3, 8]
- Enkefaline und beta Endorphine (**Opioide**)[1, 2, 8]

6 Knochen-Gesundheit?[4, 8]

7 "Fussreflexzone Massage" beim Barufussgehen (incl. TCM Meridiane, Matrix)[8]

Literatur im Appendix

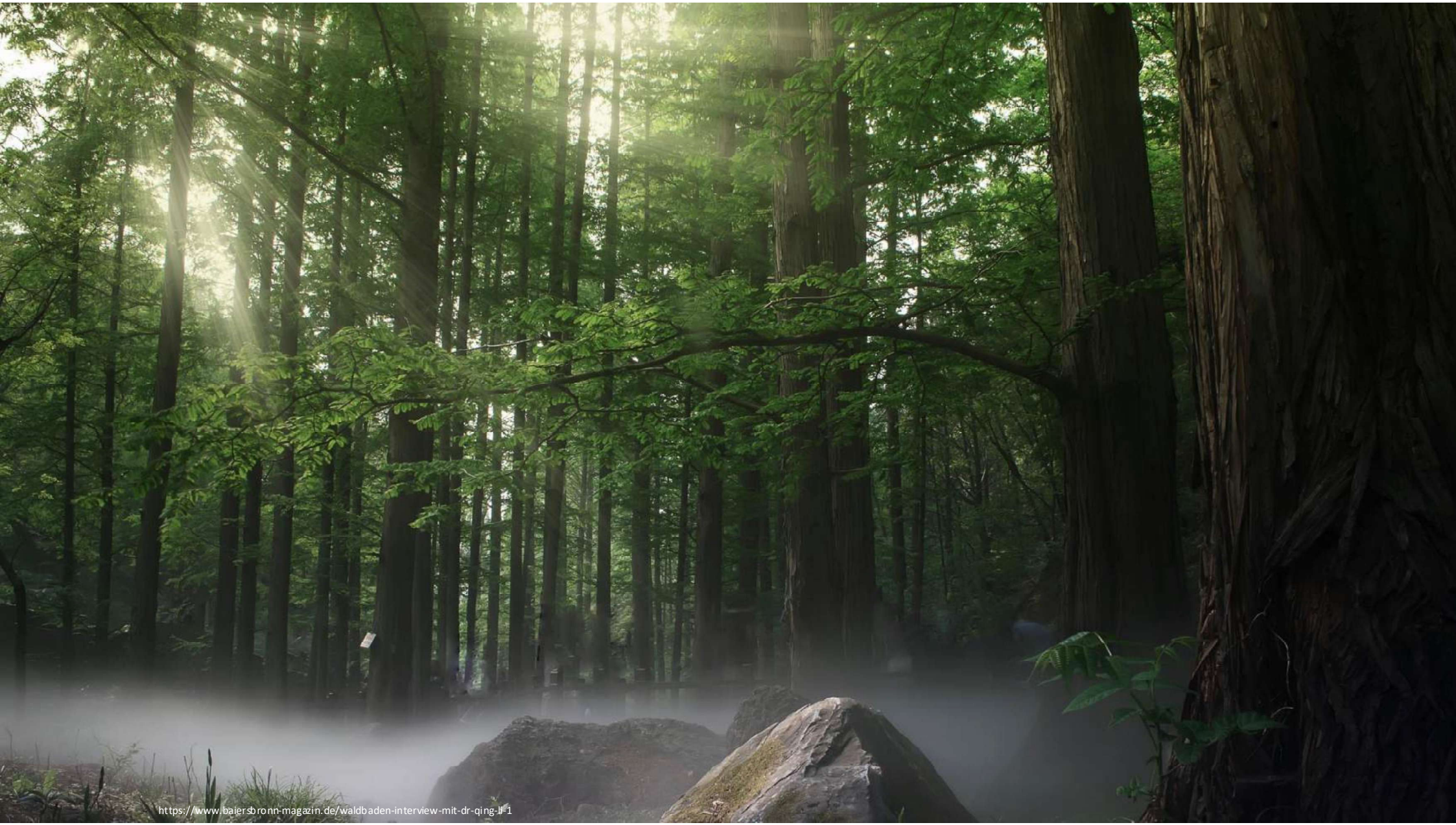
3.5 Wie sieht das ANFT Waldbaden-Konzept aus?

<u>3 Phasen (Standard-Sequence):</u>

1) ”Intro” Wanderung zum Wald, Begrüssung und Vorstellung, Geschichte vom Waldbaden, ANFT- und Shinrin-Yoku-Still, gesundheitliche Effekte vom Waldbaden, Grundprinzipien des Waldbaden-Ausfluges

2) ”Hauptteil” Verkörperung-Aktivitäten, 3-4 sensorische Einladungen und Kooperation Erlebniss-Aktivitäten mit den gemeinsamen “Sharing-Kreisen” (Austauschkreis, Teilungskreis)

3) ”Abschluss” Wald-Apero


https://www.baiersbronn-magazin.de/waldbaden-interview-mit-dr-qing-li-1

4 Waldbaden: Take Home Message

1. Regelmässige Spaziergänge (min. 15-60´ am besten morgen früh oder zu Mittag) in der Natur (Wald, Park, Wiesen) = grüne Farbe und Sonnenlicht, Terbene (Phytonzide), negative Ionen im Wald, elektromagnetisches Feld, Wald-Mikrobiom und Wald-Geräusche (Wasser, Tiere-Insekte)
2. Lebende Pflanzen und Natur nahe Strukturen. Regelmässig ins Grüne schauen. Natur Klang im Hintergrund

3. Morgen früh 15-30 Minuten Sonne (Zirkadian Zyklus). Solar Noon direkter Kontakt mit der Sonne (je nach GPS, Haut-Typ; Dminder Dr. Holick = Erhöhung der Toleranz (alpha MSH Stimulation). Extreme UVR vermeiden. Blaues Licht Kontakt minimieren. Dunkelheit in der Nacht (blackout).

4. Regelmässiger täglicher direkter Kontakt (Hände, Füsse) mit der (nassen) Erdoberfläche (15-60 Minuten) z.B. schwimmen in der reinen Natur und Kneippen in Flüssen, sitzen auf den Wiesen oder im Park auf der Erde. Falls möglich in der Natur Barfussgehen Ausflüge machen (auch im Winter oder mit speziellen Socken wie z.B. FYF: Free Your Feet).

PHOENIX HEALTH

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Appendix Studien: Waldbaden

1 Hansen MM, Jones R, Tocchini K. Shinrin-Yoku (Forest Bathing) and Nature Therapy: A State-of-the-Art Review. Int J Environ Res Public Health. 2017 Jul 28;14(8):851. doi: 10.3390/ijerph14080851. PMID: 28788101; PMCID: PMC5580555.

https://pmc.ncbi.nlm.nih.gov/articles/PMC5580555/pdf/ijerph-14-00851.pdf

Shinrin Yoku (SY) is a traditional Japanese practice of immersing oneself in nature by mindfully using all five senses. During the 1980s, SY surfaced in Japan as a pivotal part of preventive health care and healing in Japanese medicine. SY may be considered a form of Nature Therapy (NT). Evidence Based Medicine (EBM) data and the "preventive medical effect." Individuals living and interacting in green spaces (GS) report being more energetic, in good overall health and, have more of a sense of meaningful purpose in life.

Nature has great benefits for the human brain and this is shown through increased happiness, health/well-being and cognition. Swiss-German physician, Paracelsus, declared: "The art of healing comes from nature, not from the physician"

2 Payne, Mark & Delphinus, Elias. (2019). The most natural of natural therapies: A review of the health benefits derived from Shinrin-Yoku (Forest Bathing). Advances in Integrative Medicine. 6. S109-S110. 10.1016/j.aimed.2019.03.316.

https://www.researchgate.net/publication/332793353_The_most_natural_of_natural_therapies_A_review_of_the_health_benefits_derived_from_Shinrin-Yoku_Forest_Bathing

Conclusion: The current evidence demonstrates significant benefit for human health in relation to cardiovascular, immune, neuro-endocrine function and psyche. Forest soils are incredibly rich sources of microbial diversity and these microbes are readily dispersed in the air. **Microbes in the air** can positively effect the body and **immune system via nasal inhalation** and contact with skin. **Negatively charged ions** are found in higher concentrations in natural environments. Negative ions have shown to **improve mood and reduce inflammation.**

3 Li Q. Effect of forest bathing trips on human immune function. Environ Health Prev Med. 2010;15(1):9-17. doi:10.1007/s12199-008-0068-3

https://pmc.ncbi.nlm.nih.gov/articles/PMC2793341/pdf/12199_2008_Article_68.pdf

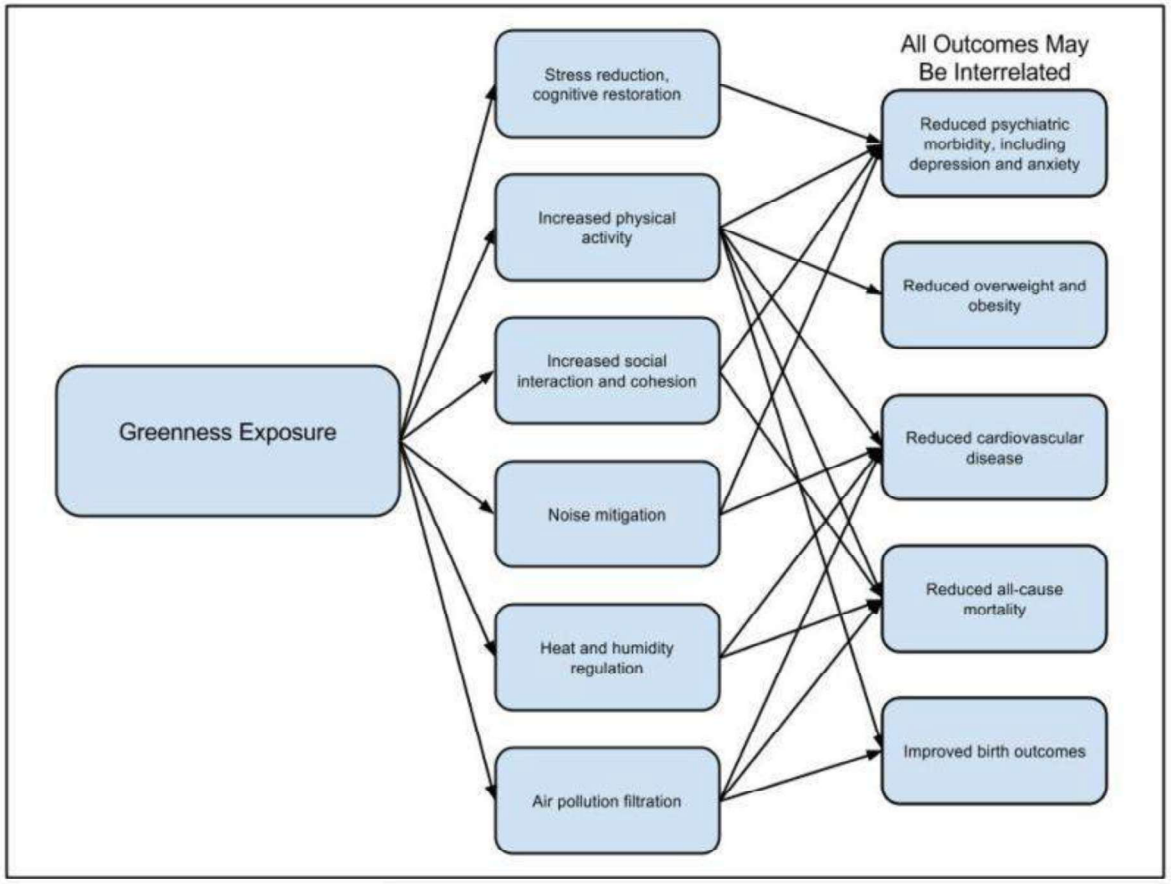
In Japan, a forest bathing trip, called "Shinrinyoku" in Japanese, is a short, leisurely visit to a forest; it is regarded as being similar to natural aromatherapy. The mean values of NK activity and the numbers of NK, granulysin-, perforin-, and granzymes A/B-expressing cells on forest bathing days were significantly higher than those on the control days, whereas the mean values of the concentration of urinary adrenaline on forest bathing days were significantly lower. The increased NK activity lasted for more than 30 days after the trip.

Karōshi (jap. 過労死 *karō shi*, *Tod durch Überarbeiten*

4 James P, Banay RF, Hart JE, Laden F. A Review of the Health Benefits of Greenness. Curr Epidemiol Rep. 2015;2(2):131-142. doi:10.1007/s40471-015-0043-7. Department of Epidemiology, Harvard T.H. Chan School of Public Health Department of Environmental Health

https://pmc.ncbi.nlm.nih.gov/articles/PMC4500194/pdf/nihms-688803.pdf

Friluftsliv is a Scandinavian philosophy based on **spiritual connectedness with the landscape. Higher levels of social cohesion** linked to multiple health outcomes.



5 Ibrahim MM, Patwardhan A, Gilbraith KB, Moutal A, Yang X, Chew LA, Largent-Milnes T, Malan TP, Vanderah TW, Porreca F, Khanna R. Long-lasting antinociceptive effects of green light in acute and chronic pain in rats. Pain. 2017 Feb;158(2):347-360. doi: 10.1097/j.pain.0000000000000767. PMID: 28092651; PMCID: PMC5242385.

https://pmc.ncbi.nlm.nih.gov/articles/PMC5242385/pdf/nihms829462.pdf

Rats receiving green LED light (wavelength **525 nm, 8 h/d**) showed significantly increased paw withdrawal latency to a noxious thermal stimulus. **Antinociception was not due to stress/anxiety but likely due to increased enkephalins** expression in the spinal cord. Naloxone reversed the antinociception, suggesting involvement of central **opioid circuits.**

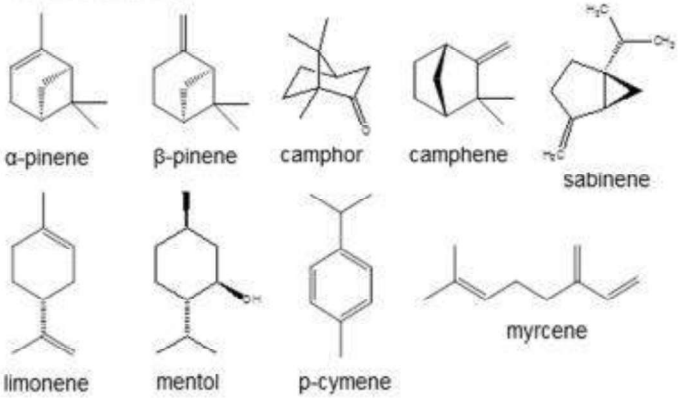
6 Cho KS, Lim YR, Lee K, Lee J, Lee JH, Lee IS. Terpenes from Forests and Human Health. Toxicol Res. 2017;33(2):97-106. doi:10.5487/TR.2017.33.2.097
Research Center for Coupled Human and Natural Systems for Ecowelfare, Konkuk University, Seoul, Korea

https://pmc.ncbi.nlm.nih.gov/articles/PMC5402865/pdf/tr-33-097.pdf

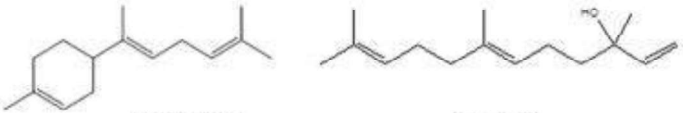
Forest bathing has beneficial effects on human health via showering of forest aerosols as well as physical relaxation. Terpenes are major components of essential oils of various medicinal plants and the major components of the forest atmosphere. Terpens are the largest class of naturally occurring organic compounds with more than 40,000 structures reported so far. Their basic chemical structure consists of an isoprene unit (C_5H_8) . Essential oils obtained from plants have been used in diverse traditional medicines. There is a sufficient data proving their anti-inflammatory, anti-tumorigenic and neuroprotective activities.

(A)

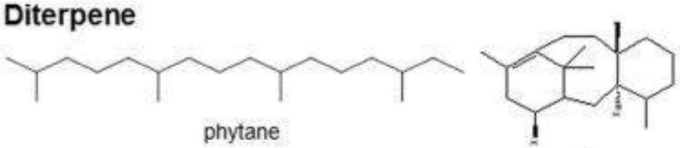
Monoterpene



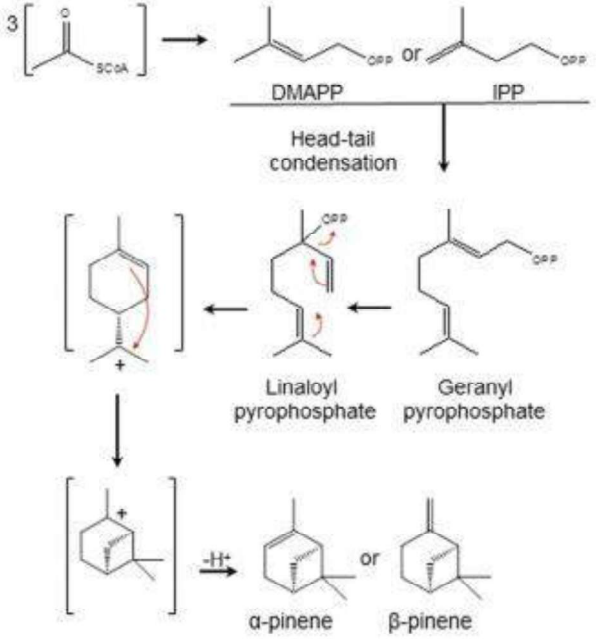
Sesquiterpene



Diterpene

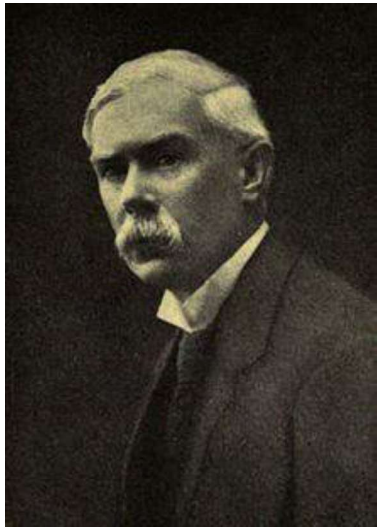


(B)



7 Logan AC, Selhub EM. Vis Medicatrix naturae: does nature "minister to the mind"? Biopsychosoc Med. 2012 Apr 3;6(1):11. doi: 10.1186/1751-0759-6-11. PMID: 22472137; PMCID: PMC3353853.

Green, terpenes, microbes, and ions allow the body to naturally heal itself and go into a beneficial reflexive state.



The healing power of nature - *vis medicatrix naturae* - is an ancient medical principle that includes reference to the innate ability of the body to heal itself.

https://pmc.ncbi.nlm.nih.gov/articles/PMC3353853/pdf/1751-0759-6-11.pdf

"*What then do I mean tonight by the healing power of nature? I mean to refer to the way in which Nature ministers to our minds, all more or less diseased by the rush and racket of civilization, and helps to steady and enrich our lives. My first point is that there are deeply-rooted, old established, far-reaching relations between Man and Nature which we cannot ignore without loss... there would be less "psychopathology of everyday life" if we kept up our acquaintance... we have put ourselves beyond a very potent vis medicatrix if we cease to be able to wonder at the at the grandeur of the star-strewn sky, the mystery of the mountains, the sea eternally new, the way of the eagle in the air, the meanest flower that blows, the look in a dog's eye*."

Professor J. Arthur Thomson - "*Vis Medicatrix Naturae*" - Keynote Address at the Annual Meeting of the British Medical Association, 1914.

8 Gladwell VF, Kuoppa P, Tarvainen MP, Rogerson M. A Lunchtime Walk in Nature Enhances Restoration of Autonomic Control during Night-Time Sleep: Results from a Preliminary Study. Int J Environ Res Public Health. 2016 Mar 3;13(3):280. doi: 10.3390/ijerph13030280. PMID: 26950138; PMCID: PMC4808943.

https://pmc.ncbi.nlm.nih.gov/articles/PMC4808943/pdf/ijerph-13-00280.pdf

Markers for vagal activity (HRV indicators = SDNN, rMSSD and SD1) during sleep following the walk in nature were all significantly higher than following Built walk. HRV monitoring during sleep has identified a nocturnal zenith in cardiac vagal activity coincident with peak melatonin and a nadir in circulating cortisol concentrations. Augmenting vagal activity during sleep could enhance restoration and sleep quality.

As human beings have lived in the natural environment for most of their existence (over 5 million years), it is likely that the physiology of humans is best suited for natural environments and these are likely to promote relaxation and restoration.

Appendix Studien: Sonne und Wärme

1 Hoel DG, Berwick M, de Gruijl FR, Holick MF. The risks and benefits of sun exposure 2016. Dermatoendocrinol. 2016 Oct 19;8(1):e1248325. doi: 10.1080/19381980.2016.1248325. PMID: 27942349; PMCID: PMC5129901.

2 Fell GL, Robinson KC, Mao J, Woolf CJ, Fisher DE. Skin β-endorphin mediates addiction to UV light. Cell. 2014 Jun 19;157(7):1527-34. doi: 10.1016/j.cell.2014.04.032. PMID: 24949966; PMCID: PMC4117380.

Following UV exposure, epidermal keratino-cytes synthesize proopiomelanocortin (POMC) that is processed to melanocyte-stimulating hormone (aMSH), inducing tanning. We show that, in rodents, anotherPOMC-derived peptide, b-endorphin, is coordinately synthesized in skin, elevating plasma levels after low-dose UV. Increases in pain-related thresholds are observed and reversed by pharmacologic opioid antagonism. Opioid blockade also elicits withdrawal signs after chronic UV exposure

3 Skobowiat C, Slominski AT. UVB Activates Hypothalamic-Pituitary-Adrenal Axis in C57BL/6 Mice. J Invest Dermatol. 2015 Jun;135(6):1638-1648. doi: 10.1038/jid.2014.450. Epub 2014 Oct 15. PMID: 25317845; PMCID: PMC4398592.

UVB stimulated plasma levels of CRH, Ucn, β-END, ACTH and CORT, and increased skin expression of Ucn, β-END and CORT at the gene and protein/peptide levels. UVB stimulated CRH gene and protein expression in the brain that was localized to the paraventricular nucleus of the hypothalamus. In adrenal glands it increased mRNAs of melanocortin receptor type 2, StAR and CYP11B1

4 Felton SJ, Kendall AC, Almaedani AF, Urquhart P, Webb AR, Kift R, Vail A, Nicolaou A, Rhodes LE. Serum endocannabinoids and N-acyl ethanolamines and the influence of simulated solar UVR exposure in humans in vivo. Photochem Photobiol Sci. 2017 Apr 12;16(4):564-574.

5 Zanello SB, Jackson DM, Holick MF. Expression of the circadian clock genes clock and period1 in human skin. J Invest Dermatol. 2000 Oct;115(4):757-60. doi: 10.1046/j.1523-1747.2000.00121.x. PMID: 10998156.

Reverse transcriptase polymerase chain reaction revealed the **presence of clock and period1 mRNA in cultured human keratinocytes, melanocytes, and dermal fibroblasts, as well as in the human keratinocyte cell line**

6 Aulinas A. Physiology of the Pineal Gland and Melatonin. 2019 Dec 10. In: Feingold KR, Anawalt B, Boyce A, Chrousos G, de Herder WW, Dhatariya K, Dungan K, Grossman A, Hershman JM, Hofland J, Kalra S, Kaltsas G, Koch C, Kopp P, Korbonits M, Kovacs CS, Kuohung W, Laferrère B, McGee EA, McLachlan R, Morley JE, New M, Purnell J, Sahay R, Singer F, Stratakis CA, Trence DL, Wilson DP, editors. Endotext [Internet]. South Dartmouth (MA): MDText.com, Inc.; 2000–. PMID: 31841296.

Interestingly, functional **rhodopsin-containing photoreceptors have been identified in human melanocytes and keratinocytes** and may contribute to UV phototransduction.

7 Campbell SS, Murphy PJ. Extraocular circadian phototransduction in humans. Science. 1998 Jan 16;279(5349):396-9. doi: 10.1126/science.279.5349.396. PMID: 9430592.

Physiological and behavioral rhythms are governed by an endogenous circadian clock. The response of the human circadian clock to extraocular light exposure was monitored by measurement of body temperature and melatonin concentrations throughout the circadian cycle before and after light pulses presented to the popliteal region (behind the knee). A systematic relation was found between the timing of the light pulse and the magnitude and direction of phase shifts, resulting in the generation of a phase response curve. These findings challenge the belief that mammals are incapable of extraretinal circadian phototransduction and have implications for the development of more effective treatments for sleep and circadian rhythm disorders.

8 Holmström KM, Kostov RV, Dinkova-Kostova AT. The multifaceted role of Nrf2 in mitochondrial function. Curr Opin Toxicol. 2016 Dec;1:80-91. doi: 10.1016/j.cotox.2016.10.002. PMID: 28066829; PMCID: PMC5193490.

The transcription factor nuclear factor erythroid 2 p45-related factor 2 (Nrf2) is the master regulator of the cellular redox homeostasis. Nrf2 target genes comprise of a large network of antioxidant enzymes, proteins involved in xenobiotic detoxification, repair and removal of damaged proteins, inhibition of inflammation, as well as other transcription factors. In recent years it has emerged that as part of its role as a regulator of cytoprotective gene expression, Nrf2 impacts mitochondrial function. Increased Nrf2 activity defends against mitochondrial toxins.

9 Ricca C, Aillon A, Bergandi L, Alotto D, Castagnoli C, Silvagno F. Vitamin D Receptor Is Necessary for Mitochondrial Function and Cell Health. Int J Mol Sci. 2018 Jun 5;19(6):1672. doi: 10.3390/ijms19061672. PMID: 29874855; PMCID: PMC6032156.

Vitamin D receptor (VDR) mediates many genomic and non-genomic effects of vitamin D (at least **more than 1000 genes**). The active form of vitamin D (1,25(OH)2D3) exerts its beneficial effects on the whole organism by regulating calcium homeostasis and by modulating a large set of genes involved in the differentiation and **function of virtually every tissue.** The incredibly high number of target genes accounts for the pleiotropic functions of VDR. In the long run, **the absence of the receptor caused impairment of mitochondrial integrity and, finally, cell death.** Our data reveal that VDR plays a central role in **protecting cells from excessive respiration and production of ROS** that leads to cell damage.

10 Higuchi S, Motohashi Y, Ishibashi K, Maeda T. Less exposure to daily ambient light in winter increases sensitivity of melatonin to light suppression. Chronobiol Int. 2007;24(1):31-43. doi: 10.1080/07420520601139805. PMID: 17364578.

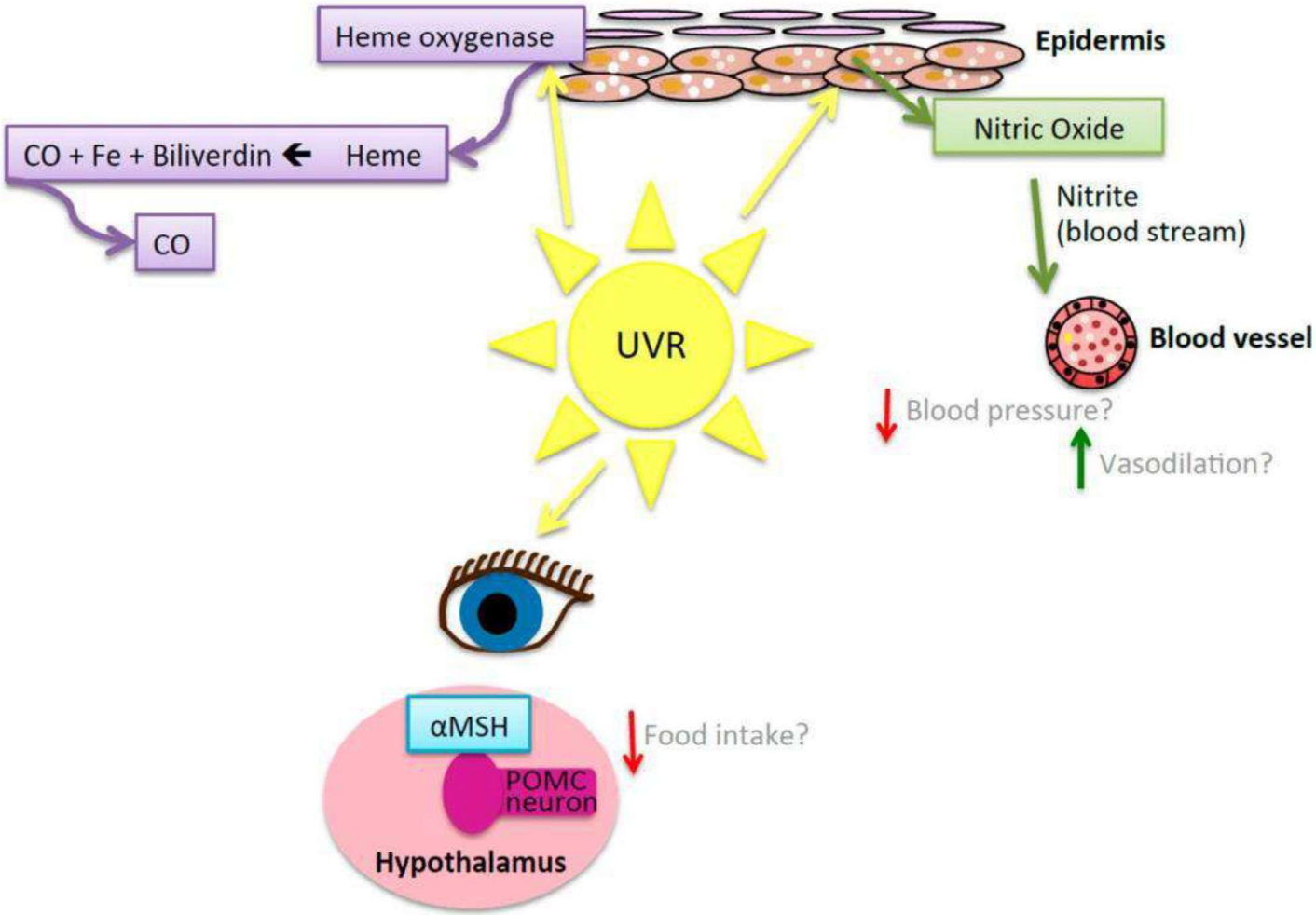
11 Boddum K, Hansen MH, Jennum PJ, Kornum BR. Cerebrospinal Fluid Hypocretin-1 (Orexin-A) Level Fluctuates with Season and Correlates with Day Length. PLoS One. 2016 Mar 23;11(3):e0151288. doi: 10.1371/journal.pone.0151288. PMID: 27008404; PMCID: PMC4805193.

12 Acuña Castroviejo D, López LC, Escames G, López A, García JA, Reiter RJ. Melatonin-mitochondria interplay in health and disease. Curr Top Med Chem. 2011;11(2):221-40. doi: 10.2174/156802611794863517. PMID: 21244359.2

13 Latham CM, Brightwell CR, Keeble AR, Munson BD, Thomas NT, Zagzoog AM, Fry CS, Fry JL. Vitamin D Promotes Skeletal Muscle Regeneration and Mitochondrial Health. Front Physiol. 2021 Apr 14;12:660498. doi: 10.3389/fphys.2021.660498. PMID: 33935807; PMCID: PMC8079814.

14 Fleury N, Geldenhuys S, Gorman S. Sun Exposure and Its Effects on Human Health: Mechanisms through Which Sun Exposure Could Reduce the Risk of Developing Obesity and Cardiometabolic Dysfunction. Int J Environ Res Public Health. 2016 Oct 11;13(10):999. doi: 10.3390/ijerph13100999. PMID: 27727191; PMCID: PMC5086738.

Recent estimates suggest that there are ~650 million people worldwide living with obesity. Animal studies suggest that chronic exposure to UVR could prevent obesity and cardiometabolic dysfunction.


Heme oxygenase
Epidermis
Nitric Oxide
CO + Fe + Biliverdin
Heme
CO
Nitrite
(blood stream)
UVR
Blood vessel
Blood pressure?
Vasodilation?
αMSH
POMC
neuron
Hypothalamus
Food intake?

Appendix Studien: Earthing und Grounding

1 Sinatra ST, Oschman JL, Chevalier G, Sinatra D. Electric Nutrition: The Surprising Health and Healing Benefits of Biological Grounding (Earthing). Altern Ther Health Med. 2017 Sep;23(5):8-16. PMID: 28987038.

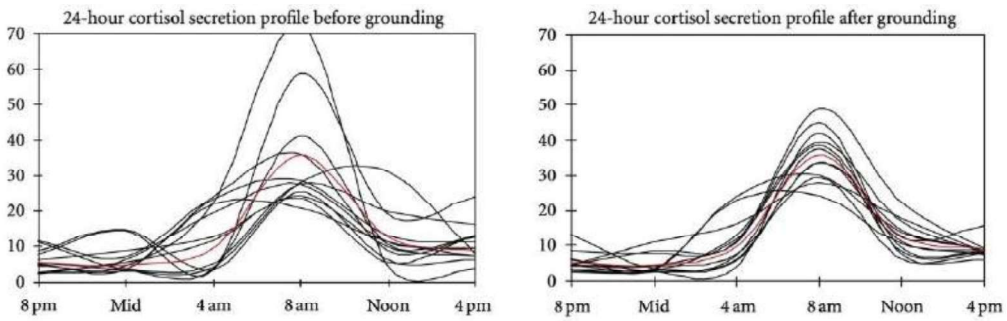
Throughout history, **humans mostly walked barefoot and slept on the ground, or they used footwear from animal skins that permitted transfer of Earth's electrons into the electrically conductive body. Humans are bioelectrical beings,** with hearts, brains, and immune and endocrine systems being regulated by internal bioelectrical signals. **Grounding** the human body represents a **universal regulating factor** in nature that strongly influences bioelectrical, bioenergetic, and biochemical processes and appears to offer a significant modulating effect on chronic illnesses. Grounding reconnects humans to one aspect that has been largely lost and overlooked

Many of the most debilitating diseases, as well as the aging process itself, are caused by or associated with chronic inflammation and oxidative stress. Electrons from Earth serve as a potent neutralizer or quencher of electron-seeking free radicals.

Human physiology has more than 100 biological rhythms that are timed and coordinated with rhythms in the environment. The invisible silent pulses of nature give rise to normal hormonal regulations. **Disconnection from the environment can disrupt these regulations. The electric field of Earth is not steady but varies from moment to moment in a rhythm known as the *Schumann resonance (7.83 Hz)*.**

"Electron transfers are the basis of virtually all antioxidant and anti-inflammatory activity. Our Earth may very well be the ultimate supplier!'

2 Chevalier G, Sinatra ST, Oschman JL, Sokal K, Sokal P. Earthing: health implications of reconnecting the human body to the Earth's surface electrons. J Environ Public Health. 2012;2012:291541. doi: 10.1155/2012/291541. Epub 2012 Jan 12. PMID: 22291721; PMCID: PMC3265077.



Environmental medicine generally addresses environmental factors with a negative impact on human health. However, emerging scientific research has revealed a surprisingly positive and overlooked environmental factor on health: direct physical contact with the vast supply of electrons on the surface of the Earth. Modern lifestyle separates humans from such contact.

Table 1: Subjective sleep, pain, and well-being feedback.

Categories	Test subjects*		Control subjects**	
	Same	Improved	Same	Improved
Time to fall asleep	4 = 15%	23 = 85%	20 = 87%	3 = 13%
Quality of sleep	2 = 7%	25 = 93%	20 = 87%	3 = 13%
Wake feeling rested	0 = 0%	27 = 100%	20 = 87%	3 = 13%
Muscles stiffness and pain	5 = 18%	22 = 82%	23 = 100%	0 = 0%
Chronic back and/or joint pain	7 = 26%	20 = 74%	23 = 100%	0 = 0%
General well-being	6 = 22%	21 = 78%	20 = 87%	3 = 13%

3 Oschman JL, Chevalier G, Brown R. The effects of grounding (earthing) on inflammation, the immune response, wound healing, and prevention and treatment of chronic inflammatory and autoimmune diseases. J Inflamm Res. 2015 Mar 24;8:83-96. doi: 10.2147/JIR.S69656.

4 Sokal K, Sokal P. Earthing the human body influences physiologic processes. J Altern Complement Med. 2011 Apr;17(4):301-8. doi: 10.1089/acm.2010.0687. Epub 2011 Apr 6. PMID: 21469913; PMCID: PMC3154031.

5 Oschman JL. Can electrons act as antioxidants? A review and commentary. J Altern Complement Med. 2007 Nov;13(9):955-67. doi: 10.1089/acm.2007.7048. PMID: 18047442.

6 Chevalier G. The effect of grounding the human body on mood. Psychol Rep. 2015 Apr;116(2):534-42. doi: 10.2466/06.PR0.116k21w5. Epub 2015 Mar 6. PMID: 25748085.

40 adult participants. This **pilot project was double-blinded** and the Brief Mood Introspection Scale (comprising 4 mood scales) was used. **Pleasant and positive moods** statistically **significantly improved among grounded-but not sham-grounded-participants.** It is concluded that the **1-hr. contact with the Earth improved mood** more than expected by relaxation alone.

7 Elkin HK, Winter A. Grounding Patients With Hypertension Improves Blood Pressure: A Case History Series Study. Altern Ther Health Med. 2018 Nov;24(6):46-50. PMID: 30982019.

All 10 patient measurements were found to be significantly improved at the end of the trial period, and some, well before the end. Systolic levels decreased during this time, ranging individually from 8.6% to 22.7%, with an average decrease of 14.3%. This is the first known study measuring the influence of grounding the body on hypertension.

8 Ober, C., Sinatra, S. T., & Zucker, M. (2014). *Earthing: The most important health discovery ever!* Basic Health Publications.