

Ke Ala Kūpono no ka Noi‘i DNA ma nā Koena Kino Kupapa‘u Kahiko: ‘Elima Kuleana Alaka‘i Punihonua

Songül Alpaslan-Roodenberg^{1,2}, David Anthony^{3,4}, Hiba Babiker⁵, Eszter Bánffy⁶, Thomas Booth⁷, Patricia Capone⁸, Arati Deshpande-Mukherjee⁹, Stefanie Eisenmann^{5,10}, Lars Fehren-Schmitz^{11,12}, Michael Frachetti¹³, Ricardo Fujita¹⁴, Catherine J. Frieman¹⁵, Qiaomei Fu¹⁶, Victoria Gibbon¹⁷, Wolfgang Haak⁵, Mateja Hajdinjak⁷, Kerstin P. Hofmann⁶, Brian Holguin¹⁸, Takeshi Inomata¹⁹, Hideaki Kanzawa-Kiriyama²⁰, William Keegan²¹, Janet Kelso¹⁰, Johannes Krause¹⁰, Ganesan Kumaresan²², Chapurukha Kusimba²³, Sibel Kusimba²³, Carles Lalueza-Fox²⁴, Bastien Llamas^{25,26}, Scott MacEachern²⁷, Swapan Mallick^{1,28,29}, Hirofumi Matsumura³⁰, Ana Y. Morales-Arce³¹, Giedre Motuzaitė Matuzevičiūtė³², Veena Mushrif-Tripathy⁹, Nathan Nakatsuka¹, Rodrigo Nores³³, Christine Ogola³⁴, Mercedes Okumura³⁵, Nick Patterson^{4,29}, Ron Pinhasi², Samayamantri P.R. Prasad³⁶, Mary E. Prendergast³⁷, Jose Luis Punzo³⁸, David Reich^{1,4,28,29}, Rikai Sawafuji³⁹, Elizabeth Sawchuk^{40,41}, Stephan Schiffels^{5,10}, Jakob Sedig^{1,4}, Svetlana Shnaider⁴², Kendra Sirak^{1,4}, Pontus Skoglund⁷, Viviane Slon^{43,44}, Meradeth Snow⁴⁵, Marie Soressi⁴⁶, Matthew Spriggs^{15,47}, Philipp W. Stockhammer^{10,48}, Anna Szécsényi-Nagy⁴⁹, Kumarasamy Thangaraj^{36,50}, Vera Tiesler⁵¹, Ray Tobler^{23,25}, Chuan-Chao Wang^{52,53}, Christina Warinner^{10,54}, Surangi Yasawardene⁵⁵, Muhammad Zahir^{5,56}

Unuhi ‘ia i ka ‘ōlelo Hawai‘i e: Kyle Kolomona Nakatsuka⁵⁷, Nathan Nakatsuka¹

- 1: Department of Genetics, Harvard Medical School, Boston, MA, USA
- 2: Department of Evolutionary Anthropology, University of Vienna, Austria
- 3: Department of Anthropology, Hartwick College, Oneonta, NY, USA
- 4: Department of Human Evolutionary Biology, Harvard University, Cambridge, MA, USA
- 5: Max Planck Institute for the Science of Human History, Jena, Germany
- 6: Romano-Germanic Commission of the German Archaeological Institute, Frankfurt am Main, Germany
- 7: Francis Crick Institute, London, UK
- 8: Peabody Museum of Archaeology and Ethnology, Harvard University, MA, USA
- 9: Department of Ancient Indian History Culture and Archaeology, Deccan College Post Graduate and Research Institute, Pune, India
- 10: Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany
- 11: Department of Anthropology, University of California, Santa Cruz, CA, USA
- 12: UCSC Genomics Institute, University of California, Santa Cruz, CA, USA
- 13: Department of Anthropology, Washington University in St. Louis, St. Louis, MO, USA
- 14: Centro de Genética y Biología Molecular, Facultad de Medicina, Universidad de San Martín de Porres, Lima, Peru
- 15: School of Archaeology and Anthropology, The Australian National University, Canberra, Australia
- 16: Key Laboratory of Vertebrate Evolution and Human Origins, Institute of Vertebrate Paleontology and Paleoanthropology, Center for Excellence in Life and Paleoenvironment, Chinese Academy of Sciences, Beijing, China
- 17: Division of Clinical Anatomy and Biological Anthropology, Department of Human Biology, University of Cape Town, Cape Town, South Africa

- 18: Department of Anthropology, University of California, Santa Barbara, CA, USA
- 19: School of Anthropology, University of Arizona, Tucson, AZ, USA
- 20: National Museum of Nature and Science, Ibaraki, Japan
- 21: Florida Museum of Natural History, Gainesville, FL, USA
- 22: Department of Genetics, School of Biological Sciences, Madurai Kamaraj University, Tamil Nadu, India
- 23: Department of Anthropology, University of South Florida, Tampa, FL, USA
- 24: Institute of Evolutionary Biology (CSIC-UPF), Barcelona, Spain
- 25: Australian Centre for Ancient DNA, School of Biological Sciences and The Environment Institute, University of Adelaide, Adelaide, SA, Australia
- 26: ARC Centre of Excellence for Australian Biodiversity and Heritage, University of Adelaide, Adelaide, SA 5005, Australia
- 27: Office of the Chancellors, Duke Kunshan University, Jiangsu, China
- 28: Howard Hughes Medical Institute, Boston, MA, USA
- 29: Broad Institute of MIT and Harvard, Cambridge, MA, USA
- 30: School of Health Science, Sapporo Medical University, Sapporo, Hokkaidō, Japan
- 31: Institute of Ecology and Evolution, University of Bern, Bern, Switzerland
- 32: Lithuanian Institute of History and Department of Archaeology, History Faculty, Vilnius University, Vilnius, Lithuania
- 33: Departamento de Antropología, Facultad de Filosofía y Humanidades, Universidad Nacional de Córdoba, Instituto de Antropología de Córdoba (IDACOR), CONICET, Córdoba, Argentina
- 34: Earth Sciences Department, National Museums of Kenya, Nairobi, Kenya
- 35: Department of Genetics and Evolutionary Biology, University of São Paulo, São Paulo, Brazil
- 36: DBT-Centre for DNA Fingerprinting and Diagnostics, Hyderabad, India
- 37: Department of Anthropology, Rice University, Houston, TX, USA
- 38: Instituto Nacional de Antropología e Historia, Michoacán, Mexico
- 39: School of Advanced Sciences, The Graduate University for Advanced Studies (SOKENDAI), Hayama, Kanagawa, Japan
- 40: Department of Anthropology, University of Alberta, Edmonton, Alberta, Canada
- 41: Department of Anthropology, Stony Brook University, Stony Brook, NY, USA
- 42: ArchaeoZOOlogy in Siberia and Central Asia – ZooSCAN, CNRS – IAET SB RAS International Research Laboratory, Novosibirsk, Russia
- 43: Department of Anatomy and Anthropology and Department of Human Molecular Genetics and Biochemistry, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel
- 44: The Dan David Center for Human Evolution and Biohistory Research, Tel Aviv University, Tel Aviv, Israel
- 45: Anthropology Department, University of Montana, Missoula, MO, USA
- 46: Faculty of Archaeology, Leiden University, Leiden, Netherlands
- 47: Vanuatu Cultural Centre, Port Vila, Vanuatu
- 48: Institute for Pre- and Protohistoric Archaeology and Archaeology of the Roman Provinces, Ludwig Maximilian University, Munich, Germany
- 49: Institute of Archaeogenomics, Research Centre for the Humanities, Eötvös Loránd Research Network, Budapest, Hungary
- 50: CSIR-Centre for Cellular and Molecular Biology, Hyderabad, India
- 51: School of Anthropological Sciences, Universidad Autónoma de Yucatán, Mérida, Mexico
- 52: Department of Anthropology and Ethnology, Institute of Anthropology, School of Sociology and Anthropology, and State Key Laboratory of Cellular Stress Biology, School of Life Sciences, Xiamen University, Xiamen, China

53: School of Basic Medical Sciences, Zhejiang University School of Medicine, and Institute of Asian Civilizations, Zhejiang University, Hangzhou, China

54: Department of Anthropology, Harvard University, Cambridge, MA, USA

55: Department of Anatomy, University of Sri Jayewardenepura, Nugegoda, Sri Lanka

56: Department of Archaeology, Hazara University, Mansehra, Pakistan

57: Kawaiuelani Center for Hawaiian Language, University of Hawai'i at Mānoa, Honolulu, HI, USA

Inā he nīnau a mana‘o paha kou, e leka iā: Lars Fehren-Schmitz (lfehrens@ucsc.edu), Nathan Nakatsuka (nathan_nakatsuka@hms.harvard.edu), Mary Prendergast (mary@rice.edu), David Reich (reich@genetics.med.harvard.edu), Jakob Sedig (Jakob_Sedig@hms.harvard.edu), Kendra Sirak (Kendra_Sirak@hms.harvard.edu), Philipp Stockhammer (philipp.stockhammer@lmu.de)

‘Ōlelo Mua

He hui kānaka hulikoehana, kānaka huli kanaka, luna hō‘ili‘ilina, a kānaka kālaiōewe mākou no nā kaiāulu punihonua like‘ole no nā ‘āina he 31. Ua hui mākou i Nowemapa M.H. 2020 ma kekahi hui ho‘ona‘auao pūnaewe e pili ana i nā mana‘o kū i ka pono no ka ‘oihana noi‘i DNA kahiko. Ua lōkahi mākou i ka mana‘o ua pono nā kuleana alaka‘i punihonua no ka hana kūpono, ‘oiai ua pa‘i ‘ia aku nei kekahi mau ‘ōlelo a‘oa‘o i ho‘okumu ‘ia no ka noi‘i koena kino kupapa‘u ma ‘Āmelika ‘Ākau, akā ‘a‘ole na‘e i pili i ka honua holo‘oko‘a i nā manawa a pau. Me ka no‘ono‘o ‘ana i nā ‘ano o nā pō‘aiapili like‘ole, hāpai mākou i kēia mau Kuleana Alaka‘i Punihonua: 1) E hō‘oia nā kānaka noi‘i i ka ho‘okō ‘ia o nā kānāwai a pau o nā wahi e hana ana a me nā wahi i loa‘a mua ai nā koena kino kupapa‘u kānaka. 2) E ho‘omākaukau mua nā kānaka noi‘i i kekahi papa ho‘olālā piha ma mua o ka ho‘omaka ‘ana i kekahi papahana noi‘i. 3) E ho‘ēmi nā kānaka noi‘i i ka hō‘ino ‘ana i nā koena kino kupapa‘u e like me ka hiki. 4) E ho‘ō‘oia nā kānaka noi‘i e noa ka ‘ikepili ma hope o ka pa‘i noi‘i i mea e paka ‘ia ai nā hua noi‘i ‘epekema. 5) E hui nā kānaka noi‘i i me nā kānaka nona kekahi pili kuleana mai kinohi mai o ka papahana noi‘i, a e hō‘oia i ka hō‘ihi a me ka ho‘olohe i ko lākou mana‘o.

Ho‘ohiki mākou e ho‘okō i kēia mau kuleana alaka‘i, a mahu‘i mākou e paipai nā kuleana alaka‘i i kekahi ana ho‘ohālike kūlana ki‘eki‘e no kēia mua aku.

Ho‘olauna

Ua lilo ke kālailai pūewe kānaka kahiko he ala ikaika loa no ka noi‘i ‘ana i nā pilina o ko kahiko kekahi i kekahi a me ka pilina o ko kahiko i ko ke au nei. Hō‘ike mau kēia noi‘i i ka mana‘o: ke loa‘a kekahi po‘e ma kekahi wahi, ma muli ia o ka mo‘olelo lō‘ihi no ka ne‘e ‘ana a me ka launa ‘ana. I nā makahiki he ‘umi i hala iho nei, e hua‘i ana ka DNA kahiko i ka ‘ikena hou, na kēia

‘ike pū me ko nā māhele akeakamai ‘ē a‘e e hō‘ole ‘ana i nā kuhihewa o ka “lāhui piha” a me nā mana‘o ho‘okae‘ili a ho‘oki‘eki‘e lāhui. Ua ho‘ohana hewa kekahi i ke kālāi oewe i mea e ho‘oholo ai i nā lālā lāhui, akā na‘e i ko mākou mana‘o, ‘a‘ole kūpono ka ho‘ohana ‘ana i ka ‘ikepili kālāi oewe no ka pane ‘ana i ka nīnau, "he lālā ‘oe no ke kumu hea?".

‘Oiai ke nui a‘e nei ka ‘ikepili pūewe piha i ho‘olaha ‘ia - ‘a‘ohe loa i ka makahiki 2009, a he 6000 a ‘oi i kēia manawa - ke nui a‘e nei ke kūkākūkā ‘ana no ke ala kūpono e ka‘a ai ka noi‘i DNA kahiko²⁻¹⁶, a kūkulu ‘ia ma luna o ke kahua o ke kūkākūkā ‘ana ma mua o kēlā¹⁷⁻²⁴. He keu kēia kumuhana a ke ko‘iko‘i ma muli o ka ulu ‘āwīwī ‘ana o ka māhele, nā hopena o ka noi‘i ēweewe no ke kaiapili a me ke kālāi‘āina, a me ka pono e hō‘ihi i nā kūpuna kahiko nona kēia mau kino kupapa‘u e kaiiele ‘ia ma muli o ka noi‘i DNA kahiko.

Like‘ole nā kuleana alaka‘i a nā aupuni a me nā hālau noi‘i no ka ‘imi ‘ana i ka ‘āpono e kālailai i nā kino kupapa‘u kahiko, a ‘a‘ole lākou hō‘oia i ke kūpono a me ka ho‘olōkahi o ka noi‘i i nā manawa a pau. He kuleana ko nā kānaka noi‘i i ‘oi ma luna o nā koina o kekahi mau aupuni/hālau noi‘i, akā ‘a‘ole lōkahi nā mana‘o no ke ‘ano o kēia kuleana^{11,25-27}. Pāku‘i pinepine ‘ia nā ha‘ina e wehewehe ana i ka mālama ‘ana i nā kuleana hana noi‘i kūpono ma nā ‘atikala noi‘i DNA kahiko²⁸⁻³⁸, a kāko‘o mākou i kēia holomua ‘ana. Ke ho‘omaka nei nō ho‘i nā ‘ahahui pili ‘oihana e ho‘okumu i nā kuleana alaka‘i^{15,39}, a ma ke emi loa, ai nō kekahi ha‘awina kālā noi‘i no ka huli ‘ana i kēia mau mana‘o ma ka pō‘aiapili o ka noi‘i i ko ‘Āmelika ‘Ākau po‘e kahiko⁴⁰. Nele na‘e i ka pa‘a ‘ole o kekahi ha‘ina kuleana hana kūpono i ‘āpono ‘ia e kekahi hui o nā kānaka akeakamai noi‘i DNA kahiko mai nā wahi like‘ole o ka honua.

Ua ho‘ohui mākou i nā kānaka hulikoehana, nā kānaka huli kanaka, nā luna hō‘ili‘ilina, a me nā kānaka kālāioewe he 60 a ‘oi, no nā aupuni he 30 a ‘oi, a no nā kaiāulu punihonua like‘ole no

kekahi hui ho‘ona‘auao pūnaewele i nā lā 4-5 o Nowemapa 2020. Kāko‘o piha nā lālā a pau i ka noi‘i DNA kino kupapa‘u kahiko ma ke ‘ano kūpono, kohu i nā kuleana, a me ka no‘ono‘o i nā kuana‘ike like‘ole o nā kānaka nona kekahi pili kuleana (‘o ia ho‘i nā mamo o nā kānaka nona ke kino kupapa‘u, nā mea no lākou ke kuleana e mālama i nā kino kupapa‘u, a me nā kānaka noi‘i). E hō‘ike mākou i kekahi mau hihia ho‘ona‘auao o nā ‘ano like‘ole o ka honua i mea e ho‘ākāka ai i ka laulā o nā mea e pili ana i ke kūkākūkā ‘ana me nā kaiāulu a me nā po‘e ‘ōiwi me ke kia i ka ‘oko‘a o kēlā me kēia wahi a puni ka honua. A laila e hō‘ike mākou i kekahi mau kuleana alaka‘i punihonua no ka noi‘i DNA koena kino kupapa‘u.

Kauka‘i ka Ho‘opili Kaiāulu i ka Pō‘aiapili

Pili iā ‘Amelika Hui Pū ‘Ia ka nui o nā palapala noi‘i no ke kūpono o ka noi‘i i ka DNA o ko kahiko^{3,4,13,15}. Ma muli o kēia kūkākūkā ‘ana, ua ho‘okumu ‘ia ka ‘ōlelo a‘o no ka paipai ‘ana i ka pilina ma waena o nā kānaka noi‘i a me nā kaiāulu ‘ōiwi, a hō‘ulu‘ulu ‘ia ma kekahi Palapala Alaka‘ina Noi‘i i pai‘ ‘ia e ka ‘Ahahui Kālaiōewe Kānaka o ‘Amelika, a ua hāpai i ka mana‘o: no nā papahana noi‘i DNA kahiko, e kūkākūkā ma ke ‘ano kūhelu, e mālama pono i nā lōina pili i ka mo‘omeheu a me ka hana kūpono, e ho‘opili me ke kaiāulu a e kūkulu i ko lākou kahua noi‘i, e ho‘omohala i nā papa ho‘olālā no ka ho‘olaha ‘ana a me ka mālama ‘ana i ka ‘ikepili, a e ho‘omohala i nā papa ho‘olālā no ka ho‘okō kuleana a me ka ho‘okele ‘ana¹⁵.

Ko‘iko‘i loa ka ho‘okālele ‘ana i nā kuana‘ike o ka po‘e ‘ōiwi ma nā wahi i ho‘okolonaio ‘ia, nā wahi i hopu ‘ia ai nā ‘āina a me nā mea makamae o nā ‘ōiwi, a me nā wahi i ho‘opohō pinepine ‘ia ai nā po‘e ‘ōiwi; ke ‘ole ke kūkākūkā me ke kaiāulu ma kēia mau wahi, e ho‘opō‘ino ‘ia paha nā kaiāulu^{5,6}. Ma ‘Amelika, mālama ke Kānāwai Ho‘omalua a Ho‘iho‘i Kupapa‘u Po‘e ‘Ōiwi ‘Amelika (NAGPRA) i nā koena kupapa‘u kahiko po‘e ‘ōiwi ‘Amelika a pau i waiho ‘ia ma nā

hale noi‘i i lawe i ke kālā mai ke aupuni pekelala, a koikoi ua kānāwai nei e kūkākūkā nā hale noi‘i me nā kaiāulu ‘ōiwi, a e ‘imi ho‘i e ho‘iho‘i i nā koena kino kupapa‘u kahiko iā lākou (i loko na‘e o ka hiki ‘ole ke kuhi i ka pilina mo‘omeheu). Ma Nūhōlani, ‘imi kekahi mau kānāwai ‘ano like e ho‘iho‘i i nā koena kino kupapa‘u he 40,000 ona makahiki⁴¹ i hopu ‘ia mai nā kaiāulu ‘ōiwi o Nūhōlani a me nā Mokupuni Kōwā Torres^{42,43}. Eia na‘e, inā kāka‘ikahi nā makelia a me nā mo‘olelo e pili ai kekahi kino kupapa‘u kahiko i nā kaiāulu o ke au nei, a i ‘ole ia inā e paio nā kaiāulu o ke au nei ma muli o ka paipai ‘ana i ka mana‘o ikaika ka pilina o kekahi hui a nāwaliwali ka pilina o kekahi, ‘a‘ole paha kūpono ke ‘ano no‘ono‘o ‘ana e koikoi i ka ho‘opili ‘ana i kēlā me kēia kino kupapa‘u i kekahi kaiāulu e ō mau nei.

I kekahi manawa, he ala kūpono nō nā ‘oihana aupuni no ka hō‘ike mana‘o po‘e ‘ōiwi

Ma nā aupuni he nui o nā ‘āinapuni‘ole ‘o ‘Amelika, pili pa‘a ka mo‘olelo o nā ‘ōiwi i ka pilina aupuni a me nā ‘oihana mo‘omeheu o ke aupuni. E la‘a, ma hope o ke ho‘okū‘oko‘a o Mekiko, ua ho‘opili ka po‘e *mestizo* (po‘e hapa, koko ‘āwili), ‘o ia ho‘i ka hapa nui loa o ka heluna kanaka, i nā mo‘olelo o nā po‘e *Nahua (Aztec), Maya, Zapotec*, a me nā po‘e ‘ōiwi ‘ē a‘e, ma ke ‘ano he mahele nui o ka mau⁴⁴⁻⁴⁶. Ma Pelū, ua ho‘okumu ‘ia ka ‘Oihana Mo‘omeheu ma muli o ka mana‘o ‘o *indigenismo*, ‘o ia ho‘i kekahi paipai kālai‘āina e paipai ana i ka mo‘omeheu po‘e ‘ōiwi a me ka pale ‘ana i ka ho‘okae⁴⁷⁻⁴⁹. Ma ia ‘ano pō‘aiapili, he ‘ano ho‘opili kaiāulu maika‘i nō ka ‘imi ‘ana i ka ‘āpono o ke aupuni a i ‘ole nā ‘ahahui waiwai ho‘oilina no ke kālailai ‘ana i nā koena kino kupapa‘u, a maika‘i‘ole na‘e ka ho‘ohālike ‘ana i nā ‘ano ho‘opili kaiāulu i a‘oa‘o ‘ia ma ‘Amelika. Ma nā hana noi‘i a kekahi mau mea kākau o kēia ‘atikala, ua kākau lākou i ‘atikala noi‘i no ka DNA kahiko mai ‘Amelika Waena a me ‘Amelika Hema, a ua kū‘ē na‘e kekahi o nā mea loiloi ‘atikala me ka ‘olelo, ‘a‘ole kū kēia noi‘i i nā lōina ‘Amelika no ka ho‘opili kaiāulu^{3,4}. Mana‘o kekahi nā mea kākau no Mekiko a me ‘Amelika Waena a Hema, he

mea ho‘okamani nō a ho‘okolonaio paha kēia, ‘oiai ma nā wahi he nui, ua mahalo ‘ia nā mo‘olelo ‘ōiwi, a ua ‘oi aku kona pili ii nā lōina ‘āpono a ke aupuni a me nā ‘oihana mo‘omeheu ma mua o ko ‘Amelika.

Pūlewa nui nō na‘e ka pilina ma waena o nā kaiāulu ‘ōiwi a me nā aupuni o nā ‘Amelika, no laila e ho‘okolokolo nā kānaka noi‘i i kēlā me kēia papahana i ho‘oholo i ke ala kūpono no ke kūkākūkā me nā kaiāulu ‘ōiwi. E la‘a, ma Pelū a me Mekiko, pūlewa ka nui o ke komo ‘ana a nā po‘e ‘ōiwi i ko lākou mau aupuni. Ma Palakila, ua hopu ‘ia ka waiwai o nā po‘e ‘ōiwi, no laila ‘a‘ohe ala e komo ai lākou i ka ho‘oholo ‘ana i ka hopena o nā koehana o ko lākou mau kūpuna ke loa‘a i nā mea hulikoehana⁵⁰. Ma ‘Alekina, aia kekahi kānāwai e koikoi i ka ‘āpono o ke kaiāulu ma mua o ka ho‘omaka ‘ana i nā papahana e pili ana i nā mea pili po‘e ‘ōiwi, ‘a‘ole na‘e i wiwo ‘ia i nā manawa a pau. Ma Kuakemala, ‘o ka po‘e *Maya* a me nā po‘e ‘ōiwi ‘ē a‘e ka hapalua o ka heluna kanaka, akā kipaku ‘ia na‘e lākou mai ka lehulehu aku. Inā pēlā ke ‘ano, he kuleana ko nā lālā o ka hui noi‘i DNA kahiko e ‘imi i ka ho‘opili kaiāulu ma luna o nā koina i mea e komo ai nā mana‘o o ka po‘e ‘ōiwi i ka ho‘okele papahana ‘ana.

‘Elima Mau Kuleana Alaka‘i Punihonua no ka Noi‘i DNA Kahiko

Hō‘ike mākou i ‘elima mau kuleana alaka‘i e paipai i nā ana ho‘ohālike ki‘eki‘e no ka hana pono ma ka noi‘i DNA kahiko. Hiki ke ho‘ohana i kēia mau lula ma nā pō‘aiapili noi‘i like‘ole i wehewehe ‘ia ma luna, a ma nā wahi o ka honua i wehewehe ‘ole ‘ia no ka lawa‘ole o ka lumi, pau pū me ‘Ākia Waena, Kipelia, ‘Ākia Hikina, ‘Ākia Hikina Hema, a me ka Pakipika me Nūhōlani mā (Pahu 1). E ho‘omaka mākou ma nā kuleana alaka‘i e kuhi i ke ala kūpono no ka ‘epekema, a laila e ho‘i hou i ke kumuhana ‘o ka hō‘oia ‘ana i ka ho‘omaopopo ‘ana a nā kānaka noi‘i i nā kuana‘ike o nā kaiāulu, ‘o nā lāhui ‘ōiwi kekahi.

- 1) E hō‘oia nā kānaka noi‘i i ka ho‘okō ‘ia o nā kānāwai a pau o nā wahi e hana ana a me nā wahi i loa‘a mua ai nā koena kino kupapa‘u kānaka. E ho‘oholo nā kānaka noi‘i i ke kūpono o ka noi‘i ma o ka no‘ono‘o ‘ana i ke ‘ano o kahi e hana ai i ka noi‘i DNA kahiko. Iā nā kānaka noi‘i nō a ho‘okumu i ka papahana, e wiwo lākou i nā kānāwai a pau o ia wahi. He mea ahuwale paha kēia, akā na‘e ua ‘ike nā mea kākau o kēia pepa, i kekahi manawa, ‘a‘ole wiwo nā kānaka noi‘i DNA kahiko i nā ‘aelike a pau. E la‘a, pono paha e ‘imi a loa‘a nā ‘aelike no ke kālailai ‘epekema a i ‘ole ke kāpuka i nā makelia kaiameaola mai nā pae like‘ole, mai ka pae hālau noi‘i, ka pae pili loko, ka pae mahele ‘āina, a me ka pae kaumoku‘āina, a pono ho‘i e ho‘omākaukau i palapala hō‘ike no nā hui nāna i ho‘olako i nā koena kino kupapa‘u ma kekahi papa kuhikuhi manawa i ‘aelike mua ‘ia. Inā lawa‘ole nā lula o kekahi wahi⁶⁸, e koho nā kānaka noi‘i e ho‘opili i ka hana ‘oi o ke kūpono i loko na‘e o ke koikoi ‘ole ‘ia.
- 2) E ho‘omākaukau mua nā kānaka noi‘i i kekahi papa ho‘olālā piha ma mua o ka ho‘omaka ‘ana i kekahi papahana noi‘i. E komo ma ua papa ho‘olālā nei kekahi wehewehe ‘ana i nā nīnau noi‘i; kekahi wehewehena i nā ki‘inahana e ho‘ohana ‘ia, a me kekahi hō‘ike hopena koena kino kupapa‘u (e hō‘ike ‘ia nā iwi/mahele iwi e noi‘i ‘ia a me ka nui/kaumaha e ho‘ohana ‘ia); kekahi wehewehena i ke ‘ano o ka ‘ikepili DNA e ho‘ohua ‘ia; kekahi papa ho‘olālā no ka ho‘oka‘ana ‘ana i ka ‘ikepili me nā hui noi‘i e komo pū ana i ka hana; kekahi papa kuhikuhi manawa no ka ho‘iho‘i ‘ana i nā makelia i ho‘ohana ‘ia a me ka ho‘olaha ‘ana i nā hua noi‘i; kekahi papa ho‘olālā no ke ‘ano, kahi, a me ka/nā mea nāna e ho‘olaha i nā hua noi‘i; kekahi papa ho‘olālā no ke kūkulu kahua [kuhi kēia i ke kuleana o ka hui noi‘i e kōkua ma ke a‘o ‘ana aku a me ka ho‘oma‘ama‘a ‘ana i ke kaiāulu ma kahi i hana ‘ia ai ka noi‘i i mea e hiki ai iā lākou ke hana i ia ‘ano noi‘i i ka

wā e hiki mai ana] a i 'ole ka ho'oma'ama'a 'ana inā he mea kēia e mahalo 'ia ma ke kaiāulu; a me kekahi papa ho'olālā i kū i nā loina 'ikepili hāmama, a 'aelike 'ia e nā kānaka/hui a pau nona kekahi pili kuleana, no ka mālama 'ana a ho'oka'ana 'ana i ka 'ikepili. E ho'oholo ka papa ho'olālā i ke ākea o ka noi'i a e hō'ike ia i nā hua like'ole e hiki ana me ka ho'okamani 'ole a me ka ho'omaopopo 'ana, he nui nā ala mahu'i 'ole 'ia ma ke kālailai 'ikepili oewe.

He mo'olelo ka papa ho'olālā no ka noi'i i ho'oholo mua 'ia, a hiki ke nānā hou iā ia inā 'auana ka noi'i mai laila aku. Inā makemake nā kānaka noi'i e ho'ololi i ke 'ano o ka noi'i, aia a kāko'o nā kānaka na lākou i komo i ka 'aelike kumu, a laila hiki ke ho'ololi. E ho'omaopopo nā kānaka noi'i, ke 'ae 'ia ka noi'i i nā koena kino kupapa'u kahiko, e lilo nā kānaka noi'i i kahu no ia mea, i mea e ho'okō ai i ka papahana i 'ae 'ia, akā na'e 'a'ole e ho'ili piha ke kuleana no ke kino kupapa'u i nā kānaka noi'i. Aia i nā kānaka noi'i ke kuleana 'o ka ho'olaha 'ana i kā lākou papa ho'olālā noi'i i nā kānaka no lākou ke kuleana no ke/nā kino kupapa'u a me nā hui 'ē a'e no lākou kekahi kuleana e hāpai mana'o. No laila, e kākau 'ia ka papa ho'olālā ma ke 'ano e ho'omaopopo ai nā anaina ma'a 'ole i nā mea no'eau e pili ana i ka noi'i. Inā he kūpono a 'aelike 'ia ho'i e nā kānaka a pau no lākou ke kuleana, e kuhi paha ka papa ho'olālā noi'i i kekahi ala e ho'ihoho'i ai i nā koena kino kupapa'u mai kahi 'āina 'ē a i kona kulāiwi.

- 3) E ho'ēmi nā kānaka noi'i i ka hō'ino 'ana i nā koena kino kupapa'u e like me ka hiki. Ko'iko'i loa ka ho'ēmi 'ana i ka ho'opō'ino 'ana a ka noi'i i nā hō'ili'ilina huli kanaka ma muli o ka nānā nui 'ia o ua mea nei 'o ka iwi kohu pōhaku o ka iwi po'o i kēia mau lā, 'oia ma laila e loa'a ai ka 'ikepili oewe he nui loa aku ma mua o ko nā iwi 'ē a'e⁷¹⁻⁷⁴. E ho'omohala nā kānaka noi'i i kekahi ka'akālai ma o ke kūkākūkā me nā kānaka/hui a pau

nona kekahi pili kuleana i mea e kaulike ai ka mālama ‘ana i nā koena kino kupapa‘u a me ka pono o ke kālailai ‘epekema. E ho‘oma‘ama‘a ‘ia nā kānaka noi‘i ma nā ki‘inahana ‘oi loa ma mua o ka ‘ohi‘ohi koena kino kupapa‘u i mea e ho‘ēmi ai i ka ‘ino a ho‘onui ai ho‘i i ka ‘ikepili waiwai e loa‘a e like me ka hiki^{11,12,75-78}. E ‘ohi‘ohi ‘ia ka nui makelia e pono ai ka ho‘okō ‘ana i nā pahuhopu noi‘i, ‘a‘ole na‘e e pākela ‘ohi‘ohi. Ke ‘ohi‘ohi, e palapala ‘ia ka ‘ohi‘ohi ‘ana, a e hō‘ike ‘ia kēia palapala inā mea nona ke kuleana no ke koena kino kupapa‘u. E hō‘ike ‘ia ho‘i nā hua noi‘i a pau, i mea e pale ai i kā ha‘i ho‘ā‘o hou i ka noi‘i ‘ano like me nā koena kino kupapa‘u me nā koena kupapa‘u i ho‘ohana ‘ole ‘ia, keu ho‘i ka mea kakakē o ka DNA. Ma mua o ka pō‘alo ‘ana i ka DNA, e palapala ‘ia ke ‘ano o nā iwi ke nānā aku ma o ka pa‘i ki‘i ‘ano miomio a me ka haka pono hulikoehana kālaimeaola. Ma ke emi loa, no nā kino kupapa‘u kahiko loa a i ‘ole nā mea no nā kahua ‘ano kūikawā, e hana ‘ia nā ki‘i micro-CT a i ‘ole e ho‘ohālike i nā iwi (hana i kūkohu). Eia hou, e kūkākūkā ‘ia: ‘o ka mea ola holoholona a i ‘ole nā mea ‘ē a‘e ka mea e kālailai mua ‘ia ma ke kahua hulikoehana i mea e mālama ai i ka DNA o laila.

Ma hope o ka ‘ohi‘ohi ‘ia nā hāpana, hiki nō ho‘i ke kāko‘o i ka mālama pono ‘ana i nā koena kino kupapa‘u ma o ka ho‘oka‘ana ‘ana i nā makelia a me nā hua lātoma i loa‘a, e la‘a me ka DNA i pō‘alo ‘ia a me nā waihona DNA, i mea e ho‘ēmi ai i ka ‘ohi‘ohi hou ma ka noi‘i hou aku. He kuleana ko ke kanaka noi‘i e mālama i nā hua lātoma i loa‘a no ka noi‘i hou e hō‘oia i ka noi‘i. Paipai nō ho‘i mākou i nā kānaka noi‘i e ‘imi i ka ‘āpono ‘ana i ka ho‘oka‘ana ‘ana i nā koena kino kupapa‘u a me nā hua e loa‘a ma waena o nā hui noi‘i. Kōkua kēia i ka nānā hou ‘ana i nā nīnau like i nānā ‘ia ma ka noi‘i mua, a me

ke kālailai hou ‘ana ma ke ‘ano e ho‘okela i ka noi‘i mua, inā he kālailaina ia i kohu i ka papa ho‘olālā noi‘i i ‘āpono ‘ia.

- 4) E ho‘ō‘oia nā kānaka noi‘i e noa ka ‘ikepili ma hope o ka pa‘i noi‘i i mea e paka ‘ia ai nā hua noi‘i ‘epekema. E ‘eleu ma ka pa‘i ‘ana i nā ‘ikepili mai ka DNA kahiko, a ma hope, ma ke emi loa, e ho‘olako ‘ia ka ‘ikepili no ka paka ‘ia ‘ana o ka hua noi‘i^{79,80}. Pono nā kānaka noi‘i e hō‘oia ka ho‘olako ‘ana i ka ‘ikepili i mea e hō‘oia ai i ka pololei o nā hua noi‘i e pa‘i ‘ia, a e pa‘a kēia ‘āpono ola ma nā ‘āpono kumu no ka noi‘i. He mea nui kēia i mea e pale ai i ka ho‘olaha ‘ana i nā kuhihewa a i mea ho‘i e kālailai hou ai i ka ‘ikepili me nā nīnau noi‘i like i ka wā e hiki mai ana.

He ki‘inahana ‘oi ka ho‘onoa ‘ana i ka ‘ikepili ma hope o ka pa‘i ‘ana, a ua pa‘i ‘ia nō ka hapa nui loa o ka ‘ikepili pūewe. He hō‘ike kēia, ua pono ka hana a kēia māhele o ka ‘oihana noi‘i ma muli o kēia ‘ano hana⁸¹. Ma waho o ka ho‘oholomua ‘ana i ka ‘ike ‘epekema, kāko‘o ka ho‘onoa ‘ana i ka ‘ikepili i ka malama pono ‘ana i nā koena kino kupapa‘u, ‘oia ma o ka ho‘ohana hou ‘ana i ka ‘ikepili e ho‘ēmi ai i ka ‘ohi‘ohi hou ‘ana. Mahu‘i na‘e mākou, ma kekahi ‘ano o ke kūkākūkā ‘ana me nā kānaka nona kekahi pili kuleana, e ho‘oholo lākou, he pono nō ka ho‘okapu ‘ana i ka ho‘ohana hou ‘ana i ka ‘ikepili DNA kahiko ma kekahi ‘ano. E la‘a, mali‘a paha e kaele ‘ia kekahi po‘e ma muli o ka ho‘olaha ‘ana i ka hua noi‘i, a ‘a‘ole kūpono ka ho‘onoa ‘ana i ka ‘ikepili i loko na‘e o ka waiwai o ia ho‘onoa ‘ana^{6,10,82}. He mea kēia e ho‘omaopopo ai ma o ka launa a kūkā ‘ana ma mua o ka ho‘omaka ‘ana i ka noi‘i. Inā pēnei ke ‘ano, e pa‘a ma ka papa ho‘olālā noi‘i kumu ka mana‘o: e ho‘oka‘ana wale ‘ia nō ka ‘ikepili i nā kānaka akeakamai mākaukau i ‘aelike, e kālailai wale nō lākou i ka ‘ikepili no ka hō‘oia i ka hua o ka noi‘i.

Inā ‘a‘ole ho‘onoa piha ‘ia ka ‘ikepili, na kekahi ‘ahahui mākaukau i ka mālama ‘ikepili ‘ana a me ka pili ‘ole i ka hua noi‘i e ‘auamo i ka mālama ‘ana a ho‘olaha ‘ana i ka ‘ikepili. Ua hāpai ‘ia ka mana‘o na nā kānaka/hui pili kuleana, e la‘a me nā hale hō‘ike‘ike a i ‘ole nā hui kānaka ‘ōiwi, e ‘auamo i ka mālama ‘ana i ka ho‘olaha ‘ikepili ma i nā kānaka noi‘i ma hope o ka pa‘i ‘ana^{10,13,15,83}. Eia na‘e, ‘a‘ole kū i nā lula pono o ka ‘oihana noi‘i ka hana noi‘i inā hiki i kekahi pili ‘ole i ka hua noi‘i ke hō‘ole i ka ho‘oka‘ana ‘ana i ka ‘ikepili i nā kānaka noi‘i mākaukau pono a me ka pahuhopu e nānā hou a paka i nā nīnau noi‘i i palapala ‘ia ma ka papa ho‘olālā noi‘i kumu. Aia nō kekahi mau ‘ōnaehana pa‘a no ka hō‘oia ‘ana i ka ho‘olaha ‘ana i ka ‘ikepili i ho‘onoa piha ‘ole ‘ia i nā kānaka noi‘i i noi pono i ka ‘ikepili i mea e nānā hou a paka ai. I kekahi manawa, he mea kēia e mālama ai i nā pono pilikino e pili ana i ka noi‘i pūewe o ke au hou, e like me nā waihona dbGaP a me EGA^{84,85}, akā lohi loa kēia ‘ano hana⁷⁸. Ke ho‘okumu ‘ia nei kekahi mau waihona ‘ikepili po‘e ‘ōiwi na nā kaiāulu e kāko‘o ma ka waiho ‘ana a me ka ho‘olaha ‘ana i ka ‘ikepili^{10,13,81,86,87}. Ma waena o nā kānaka noi‘i, moho kaiāulu, a me nā luna hō‘ili‘ilina, ‘a‘ole na ho‘okahi wale nō hui pili ke kuleana e kāohi i ka ho‘olaha ‘ana i ka ‘ikepili i nā kānaka noi‘i e ‘i‘ini ana e nānā hou a paka i nā nīnau noi‘i i palapala ‘ia ma ka papa ho‘olālā noi‘i kumu, akā na‘e he mea nui ana paha nā waihona ‘ikepili po‘e ‘ōiwi no ka waiho ‘ana a me ka ho‘olaha ‘ana i ka ‘ikepili no nā pahuhopu ma waho o ko ka papa ho‘olālā noi‘i kumu.

- 5) E hui nā kānaka noi‘i i me nā kānaka nona kekahi pili kuleana mai kinohi mai o ka papahana noi‘i, a e hō‘oia i ka hō‘ihi a me ka ho‘olohe i ko lākou mana‘o. Hiki i nā kānaka like‘ole nona nā pili kuleana - e like me nā kaiāulu o kekahi wahi, nā kānaka huli koehana, nā kānaka huli kānaka, nā kānaka noi‘i ōewe, nā luna hō‘ili‘ilina, a pēlā aku -

ke ho‘omaka i nā papahana noi‘i e ho‘okumu i ka ‘ikepili DNA kahiko hou, a hiki nō ho‘i iā lākou ke komo i ka hui noi‘i inā kāko‘o maoli lākou i ka noi‘i ma ke ‘ano akeakamai. E mahalo ‘ia nō ho‘i ma ka mahele “Mahalo” o nā pepa noi‘i nā kānaka ‘ē a‘e nona kekahi pili kuleana inā ‘ae lākou i ka ho‘olaha ‘ana i kona inoa. E ho‘ohui ‘ia nā kānaka nona ka pili kuleana - keu ho‘i nā hui kānaka no kahi i loa‘a ai nā koena kino kupapa‘u e noi‘i ‘ia ana - ma ke kūkākūkā ‘ana no ke ki‘inahana noi‘i, nā nīnau noi‘i, a me ka holomua a me ka holomua ‘ole o ka papahana noi‘i. E lōkahi nā kānaka noi‘i i ka hō‘ole ‘ia inā ‘a‘ole kāko‘o like nā kānaka nona nā pili kuleana i ka hana noi‘i¹⁵.

Ke lōkahi ka mana‘o o nā kānaka a pau nona ka pili kuleana no ka holomua o ka noi‘i, wahi a nā lula pono o ka noi‘i ‘epekema, hiki i nā kānaka noi‘i ke ho‘omau i ka hana noi‘i a hiki i ka wā pa‘i noi‘i me ka ‘imi ‘ole i nā ‘āpono hou aku. Ua hāpai maila kekahi po‘e i ka mana‘o e koi i ka ‘āpono ‘ia o nā ‘atikala ma mua o ka pa‘i ‘ana e nā kānaka pili kuleana i komo ‘ole i ka hui noi‘i^{15,83}, akā na‘e ‘a‘ole hiki ke hana i ka noi‘i ma lalo o kēia koina, ‘oiai inā pēlā, ‘a‘ole kū i nā lula pono o ka ‘oihana noi‘i. Eia na‘e, i loko o ka loina no ke kū‘oko‘a o ka noi‘i, ‘a‘ole e huli kua nā kānaka noi‘i i ko nā kānaka pili kuleana no‘ono‘o ‘ana no ka mana‘o o ka hua noi‘i. Waiwai ke kono ‘ana i nā kānaka pili kuleana e komo pū i ka nānā ‘ana i nā hua noi‘i ma o ka hō‘ike mana‘o a me ka paka ‘ana ma mua o ka pa‘i ‘ana, a keu ho‘i ka waiwai inā he ha‘oha‘o nā hua noi‘i a loli ka no‘ono‘o ‘ana ma muli ona. Ma o ka launa mau me nā kānaka pili kuleana ‘ē a‘e, hiki i nā kānaka noi‘i ke ho‘okō nō i ko lākou kuleana ‘o ka ho‘omaopopo ‘ana i ka hopena o kēlā me kēia ‘ano ho‘olaha ‘ana i nā hua noi‘i. Inā hō‘ike ke kūkākūkā ‘ana ‘a‘ole hiki ke pale aku i ka ho‘opilikia ‘ana i kekahi hui nona ka pili kuleana ma o ka pa‘i ‘ana i ka hua noi‘i, ‘a‘ole nō e pa‘i nā kānaka noi‘i i nā hua noi‘i.

Pono nā kānaka noi‘i e hō‘ike kūmau i nā mea hou no ka noi‘i a e ho‘ohiki lākou e hō‘ike i ka hua noi‘i i ka hopena o ka papahana noi‘i. Mai kinohi, e ho‘ākāka i nā ‘ano hua noi‘i e hiki ana, ke ‘ano ‘ē o ka ‘ikena e loa‘a ma ka ‘ikepili oewe, a me ka mana‘o, e pa‘i ‘ia paha nā hua noi‘i ‘epekema ma ke ‘ano akeakamai, ‘a‘ole na‘e ho‘ēmi kēia i ka waiwai o ka ‘ike a me ka no‘ono‘o ku‘una. Inā ‘a‘ole lōkahi ka hua noi‘i a me nā ‘ano ‘ikena ‘ē a‘e, e wehewehe ‘ia, he hō‘ailona kēia no ka pau‘ole o ka ‘ike a me nā mo‘olelo i ka hālau ho‘okahi.

E ho‘ohiki nā kānaka noi‘i i ka hana pū me nā mea nona ka pili kuleana i papahana e waiwai ai ka hua noi‘i i nā kaiāulu. E la‘a, e hana pū me ko kekahi wahi ma ka unuhi ‘ana i nā hua noi‘i i nā ‘ōlelo o ia wahi^{30,35,36,88,89}, e ho‘omohala ha‘awina kula keiki⁹⁰⁻⁹³, e ho‘omākaukau i nā pepelu no nā hale waihona puke a me nā kahua ‘ē a‘e e hui ai ke kaiāulu, a i ‘ole e hana pū me nā hale hō‘ike‘ike ma ka ho‘omākaukau ‘ana i nā hō‘ike‘ike. Inā kūpono, e kāko‘o nā kānaka noi‘i i ka ho‘omākaukau a me ka ho‘ona‘auao ‘ana i ko nā hui nona ka pili kuleana a me ko nā kaiāulu o kahi i loa‘a ai nā koena kino kupapa‘u^{4,15}, a e no‘ono‘o i nā ala e ho‘oikaika ai i nā hō‘ili‘ilina hale hō‘ike‘ike¹¹. E ho‘olako paha i nā kumu waiwai no ka ho‘okumu ‘ana, wehewehe ‘ana, a me ka ho‘olaha ‘ana i ka ‘ikepili, e la‘a me ke a‘o ‘ana i ka ‘ohi‘ohi ‘ana i nā koena kino kupapa‘i a i ‘ole nā ki‘inahana ke‘ena ho‘okolohua, a me ke kālā no ka ho‘oma‘ama‘a mau ‘ana a i ‘ole ke komo ‘ana i nā ‘aha pili ‘oihana. E hō‘oia nā ‘ahahui ho‘olako kālā noi‘i ua lawa ke kālā no nā papahana kūkulu kahua ‘oihana noi‘i.

Ka Paipai 'Ana i ka Noi'i DNA Koena Kino Kupapa'u Kahiko Kūpono

He kuleana pili 'oihana ko nā kānaka noi'i e ho'oponopono i kā ha'i hō'ike hewa i nā hua noi'i ma muli o ka pahuhopu e paipai i kekahi 'ōnaehana no'ono'o. Ma hope o ka hō'ike'ike 'ana i ka 'ikepili ma ke 'ano loa ma nā puke pai, he mea ma'a mau ka hō'ulu'ulu 'ia 'ana e nā kākau nūpepa 'epekema a i 'ole nā mea ho'ona'auao 'epekema, ma ke 'ano mālani no ka lehulehu i ma'a 'ole i ka 'ike 'epekema. I kekahi manawa, ha'i hō'ike hewa nā kākau nūpepa a me nā aupuni i nā hua noi'i no kekahi pahuhopu polikika. Inā he manawa kūpono, he kuleana ko nā kānaka akeakamai e ho'oponopono i ka hō'ike ha'i hewa⁶⁶. Hiki ke kākau i pepa hō'ike mana'o, kākau puke, a hō'ike mana'o ma ka pūnaeweale a me nā wikiō hō'ike'ike⁹⁴⁻¹⁰².

He mau lālā ko kākou hui no nā wahi a me nā 'oihana like'ole, a kāko'o piha loa nō na'e lākou a pau i kēia mau kuleana alaka'i, no laila mahu'i mākou e kāko'o nō ho'i ke kaiāulu ākea o ka 'oihana noi'i DNA kahiko. E lilo paha kēia i kahua no nā puke pai, nā hui pili 'oihana, a me nā 'ahahui ho'olako kālā noi'i e ho'okumu ai i nā kuleana alaka'i kūhelu hou no kēia mua aku.

Pahu 1 – ‘Elima Kuleana Alaka‘i Punihonua:

- 1) E hō‘oia nā kānaka noi‘i i ka ho‘okō ‘ia o nā kānāwai a pau o nā wahi e hana ana a me nā wahi i loa‘a mua ai nā koena kino kupapa‘u kānaka.
- 2) E ho‘omākaukau mua nā kānaka noi‘i i kekahi papa ho‘olālā piha ma mua o ka ho‘omaka ‘ana i kekahi papahana noi‘i.
- 3) E ho‘ēmi nā kānaka noi‘i i ka hō‘ino ‘ana i nā koena kino kupapa‘u e like me ka hiki.
- 4) E ho‘oia nā kānaka noi‘i i ka noa o ka ‘ikepili ma hope o ka pa‘i noi‘i ‘ana i mea e paka ‘ia ai nā hua noi‘i ‘epekema.
- 5) E hui nā kānaka noi‘i i me nā kānaka nona kekahi pili kuleana mai kinohi mai o ka papahana noi‘i, a e hō‘oia i ka hō‘ihi a me ka ho‘olohe i ko lākou mana‘o.

Ka unuhi ‘ana i kēia ‘atikala i ‘iwakālua a ‘oi ‘ōlelo

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Author contributions

All authors participated in discussions and are listed alphabetically.

Competing interests

The authors declare no competing interests.

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