

Elections to Council Nucleus and Nominating committee 2024-2026

Motivation letter: Why are you interested in joining the Council Nucleus or Nominating committee (250 words max)?

I wish to join the Cardio-Oncology council as Nucleus Member. I believe I could make very positive contributions to the work of the council. I lead a busy clinical cardio-oncology service which stimulates my research. As Professor of Cardiology and Cardio-Oncology, I have a very active research programme in cardio-oncology spanning laboratory science, clinical trials and epidemiologic research. My main drive is to improve collaborative working in cardio-oncology. I firmly believe that, by working together at larger scale and by pooling talent and expertise across Europe and beyond, we have a major opportunity to increase the quality and clinical application of research to improve patient care. Inclusion of the next generation of cardio-oncologists is vital. I believe we can improve important links with oncologists and haematologists (and their professional organisations) who are of critical importance but sometimes under-represented. From high quality research comes high quality education: a key strength of the council.

Huge progress has been made in the provision of guidelines in cardio-oncology, as well as consensus definitions of cardiotoxicity, but work remains to be done. For example, I am working with National Institutes of Health to incorporate appropriate definitions of cardiovascular diseases into the next version of *Common Terminology Criteria for Adverse Events* (CTCAE) reporting. The ESC council's voice may be crucial in implementing change to these types of globally relevant initiatives. As Associate Editor of JACC:CardioOncology I would continue to champion the European voices of our specialty.

It would be a privilege to serve the council.

Curriculum vitæ

NINIAN NICHOLAS LANG

March 2024

NINIAN NICHOLAS LANG

Date of Birth: 28th May 1977
Nationality: British
Telephone: Mobile: +44 (0) 7525 633757
E-mail: Ninian.lang@glasgow.ac.uk
GMC Registration Number: 6024560 (Specialist Register [Cardiology] since 17/4/13)

CURRENT POSITIONS

Professor of Cardiology and Cardio-Oncology:

(August 2023 -) University of Glasgow, School of Cardiovascular and Metabolic Health
- Translational and clinical trials research in heart failure and cardio-oncology

Honorary Consultant Cardiologist:

(February 2019 -) Queen Elizabeth University Hospital, Glasgow
- Heart failure, general cardiology

Beatson West of Scotland Cancer Centre, Glasgow
- Clinical lead for cardio-oncology

Associate Editor:

(July 2022 -) *Journal of the American College of Cardiology: CardioOncology*

QUALIFICATIONS

FESC: November 2022

FRCP (Edin): June 2016

PhD: January 2009, University of Edinburgh

MRCP: March 2004

MB ChB: July 2001, University of Edinburgh

BSc (Hons): July 1998, University of Edinburgh
1st Class Honours in Neuroscience. Top of class.

Awards & Distinctions:

Annandale Gold Medal in Clinical Surgery

Distinctions: Medicine
Surgery
Child Life and Health
Medical Microbiology

Scottish Cardiac Society Young Investigator Award, October 2006

Bristol-Myers Squibb Cardiovascular Prize Fellowship, 2005 – 2008

PREVIOUS POSITIONS

Reader in Cardiology:
(Aug 2021 – July 2023) University of Glasgow, Institute of Cardiovascular and Medical Sciences

Clinical Senior Lecturer:
(Feb 2019 – July 2021) University of Glasgow, Institute of Cardiovascular and Medical Sciences

Consultant Cardiologist:
(Oct 2014 – Feb 2019) Queen Elizabeth University Hospital, Glasgow -
Lead consultant for heart failure

(Aug 2017 – Feb 2019) West Glasgow Ambulatory Care Hospital, Yorkhill, Glasgow -
Heart failure out-patients service

Beatson West of Scotland Cancer Centre, Glasgow -
Clinical lead for cardio-oncology

Honorary Clinical Senior Lecturer:
(Oct 2014 – Feb 2019) University of Glasgow, Institute of Cardiovascular and Medical Sciences

NRS Cardiovascular Research Champion:
(Aug 2016 – Feb 2019) NHS Greater Glasgow and Clyde, Queen Elizabeth University Hospital

Locum Consultant Cardiologist:
(Feb 2014 – Oct 2014) Royal Infirmary of Edinburgh and Western General Hospital, Edinburgh

Clinical Fellow:
(Aug 2012 – Feb 2014) Golden Jubilee National Hospital, Glasgow

- Advanced Heart Failure and Cardiac Devices
- Scottish Advanced Heart Failure Service

Lecturer in Cardiology:
(Jan 2009 – Aug 2012) University of Edinburgh

Specialist Registrar in Cardiology:
(Apr 2008 – Apr 2013) South East Scotland Deanery

Honorary Specialist Registrar:
(Apr 2011 – Aug 2012) Golden Jubilee National Hospital, Glasgow

- Scottish Advanced Heart Failure Service

Clinical Research Fellow:
(Feb 2005 – Apr 2008) University of Edinburgh

- Cardiovascular Research Division

SHO III:

(Aug 2004 – Feb 2005) SHO: Royal Infirmary of Edinburgh

- Cardiology

(Aug 2002 – Aug 2004) South East of Scotland Medical Rotation

PRHO:

- Royal Infirmary of Edinburgh: Cardiology, Nephrology and Acute Medical Admissions
- Queen Margaret Hospital, Dunfermline: General Medicine

(Aug 2001 – Aug 2002) Royal Infirmary of Edinburgh

- Cardiology, Gastroenterology, Medical Admissions, Thoracic Surgery

MEMBERSHIP OF PROFESSIONAL BODIES/LEARNED SOCIETIES

Fellow of the European Society of Cardiology

Fellow of the Royal College of Physicians of Edinburgh

Member of the International Cardio-Oncology Society

Member of British Society for Heart Failure

Scottish Heart Failure Hub Steering Group

Member of Heart Failure Managed Clinical Network, NHS Greater Glasgow and Clyde

Member of Heart Failure Association, European Society of Cardiology

Member of UK Cardio-Renal Study Group

Member of British Cardio-Oncology Society

Member of Scottish Cardiac Society

Member of British Cardiovascular Society

Member of European Society of Cardiology

LEADERSHIP ROLES

Co-Chair, Cardio-Nephro-Oncology (CaNO) Research Group, University of Glasgow

Research Lead, British Cardio-Oncology Society

Scientific and Research Committee Member, International Cardio-Oncology Society

Theme Leader, Cardiovascular Oncology, Institute of Cardiovascular and Medical Sciences, University of Glasgow

Clinical Lead, Cardio-Oncology, Beatson West of Scotland Cancer Centre

Associate Chair, Cardiovascular Operations Group, NHS Greater Glasgow and Clyde 2018-2020

Research Strategy and Delivery Committee, University of Glasgow

Steering Committee, Cardiac Safety Research Consortium Think-Tank: Cardiovascular Adverse Events Reporting in Oncology Trials (multi-national clinical, industry, FDA and EMA consortium)

JOURNAL AND EXPERT/PEER REVIEW ACTIVITIES

Associate Editor: *Journal of the American College of Cardiology: CardioOncology* (July 2022 – present) (IF: 11.1)
Associate Editor: *Circulation: Heart Failure* (February 2021 – June 2022)
Editorial Board Member: *Frontiers in Cardiovascular Medicine*
Co-Editor: *Clinical Science* Special Collection on Cardiovascular Oncology
Journal peer review: *Circulation, J Am Coll Cardiol, Eur Heart J, Eur J Heart Failure, Heart, BMJ, Hypertension, Int J Cardiol, etc*
Grant peer review: *British Heart Foundation (Fellowship and Project Grants), Heart Research UK, Kidney Research UK, Chief Scientist Office*
Expert Advisor: *Scottish Medicines Consortium*

GRANT AWARDS

Kidney Research UK (PI Prof L Tomlinson) (£80,869; April 2023 -April2024)
Kidney-related adverse events associated with intravitreal VEGF-inhibitor use: a national cohort study

Roche Diagnostics (PI Prof MC Petrie) (£3,700,000; December 2022 – December 2027)
Glasgow Biomarker Centre of Excellence in Heart Failure

Roche Diagnostics (PI Dr NN Lang) (£340,000; May 2022 – May 2025)
Biomarker and Imaging Characterisation of Inflammatory Atheroma in Patients Receiving Immunotherapy and Angiogenesis Inhibitors (BioCAPRI)

Vet Fund PGResearch Scheme, University of Glasgow (PI Prof J Morris). (£85,000; May 2022- May 2025)
Cardio-Oncology Research in Veterinary Medicine: Anti-VEGF Tyrosine Kinase Inhibitors and adverse cardiac remodelling in dogs.

Astra Zeneca (PI Prof MC Petrie) (£861,834; November 2020 – November 2022)
Treatment of diuretic resistance with the sodium glucose transporter inhibitor dapagliflozin versus thiazide diuretic in diabetic patients hospitalized with heart failure and diuretic resistance: a multi-center, open-label, randomized controlled clinical trial (DAPA-RESIST)

Roche Diagnostics (PI Dr NN Lang) (£493,000; December 2020 – June 2024)
Biomarker and imaging characterisation of BRAF and MEK Inhibitor-Induced Cardiovascular Toxicity: A prospective study in patients with cancer (BioCOBRA)

Tenovus Scotland (PI Dr K Mangion) (£19,640; June 2020 – May 2022)
Investigating the long-term cardiac sequelae of trastuzumab therapy

British Heart Foundation (PI Dr NN Lang) (£256,744; Oct 2019 – Apr 2022)
Markers and mediators of angiogenesis inhibitor-induced vascular and myocardial toxicity: A prospective study in patients with cancer.

National Institute for Health Research (PI Dr PA Henriksen) (£937,000; Feb 2017 – Aug 2021)
Cardiac CARE: A multicentre prospective randomised open-label blinded end-point controlled trial of high-sensitivity cardiac troponin I-guided combination angiotensin receptor blockade and beta blocker therapy to prevent cardiac toxicity in breast cancer patients receiving anthracycline adjuvant therapy.

- British Heart Foundation* (PI Dr R Gardner) (£429,737; June 2017 – Jan 2022)
How do arrhythmias and conduction disturbances contribute to death or rehospitalisation in patients discharged following an admission with acute heart failure? A prospective, observational, multi-centre cohort-study
- Chief Scientist's Office* (PI Dr NN Lang) (£99,907; June 2016 – October 2018)
Cancer Chemotherapeutics and the Vasculature: Endothelial Effects of VEGF Inhibitors In Vivo in Man
- Mason Medical Research Foundation* (PI Dr NN Lang) (£10,000; June 2016 – June 2018)
Intermediate and Long Term Vascular Effects of Cisplatin in Patients with Testicular Cancer
- Boehringer-Ingelheim* (PI Prof N Sattar) (£2,000,000; February 2017 – February 2019)
Comprehensive mechanistic trial of the detailed cardiorenal and metabolic effects of empagliflozin in patients with diabetes and heart failure
- Chest, Heart and Stroke, Scotland* (£47,295; January 2012 – January 2014)
Heme Oxygenase-1 Preconditioning: Protection from Endothelial Reperfusion injury (HOPPER Study)
- Royal College of Surgeons, Edinburgh* (£6,996; October 2011 – October 2012)
Effects of Heme Arginate Induction of Heme Oxygenase-1 Activity on Endothelial Function in a Healthy Volunteer Model of Ischaemia-Reperfusion Injury
- Chief Scientist's Office* (PI Prof B Frier) (£127,548; August 2009 – February 2011)
Effect of Hypoglycaemia on Myocardial Ischaemia in Patients with Diabetes Mellitus
- Wyeth Translational Medicine Research Collaboration* (PI Prof DE Newby) (£566,995; August 2008 – August 2010)
Magnetic Resonance Imaging of Human Atherosclerosis Using Smart Contrast Agents
- Chief Scientist's Office* (£60,578; January 2007 – January 2009)
Gap Junctions and Endothelium-Derived Hyperpolarising Factor Responses - New Targets for the Augmentation of Endothelial Function? (*Final report graded 'Excellent'*)
- Bristol-Myers Squibb Cardiovascular Prize Fellowship* (£130,324; January 2006 – January 2008)
The Role of Gap Junctions in the Endothelium Derived Hyperpolarising Factor Response - A Clinical Investigation Using Connexin Mimetic Peptides

PEER REVIEWED PUBLICATIONS

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- Morrow AJ, Sykes R, Saleh M, Zahra B, MacIntosh A, Kamdar A, Bagot C, Bayes HK, Blyth KG, Bulluck H, Carrick D, Church C, Corcoran D, Findlay I, Gibson VB, Gillespie L, Grieve D, Barrientos PH, Ho A, **Lang NN**, Lowe DJ, Lennie V, Macfarlane PW, Mayne KJ, Mark PB, McConnachie A, McGeoch R, Nordin S, Payne A, Rankin AJ, Robertson K, Ryan N, Roditi G, Sattar N, Stobo D, Allwood-Spiers S, Touyz RM, Veldtman G, Weeden S, Weir R, Watkins S, Welsh P, Mangion K, Berry C. Socioeconomic deprivation and illness trajectory in the Scottish population after COVID-19 hospitalization. *Commun Med (Lond)*. 2024 Feb 28;4(1):32.
- Ray R, Ford I, Cleland JGF...**Lang NN**...Brunton C. The Impact of Ferric Derisomaltose on Cardiovascular and Noncardiovascular Events in Patients with Anaemia, Iron Deficiency, and Heart Failure with Reduced Ejection Fraction. *J Cardiac Fail*. 2024 (in press).
- Docherty KF, McMurray JJV, Kalra PR, Cleland JGF, **Lang NN**, Petrie MC, Robertson M, Ford I. Intravenous iron and SGLT2 inhibitors in iron deficient patients with heart failure and reduced ejection fraction. *ESC Heart Failure*. 2024. Accepted for publication.

- Lomholt-Welch Harriet, Morrow AJ, Sykes R, Saleh M, Zahra B, MacIntosh A, Kamdar A, Bagot C, Bayes HK, Blyth K, Bulluck H, Carrick D, Church C, Corcoran D, Findlay I, Gibson VB, Gillespie L, Grieve D, Barrientos P, Ho A, **Lang NN**, Lowe DJ, Lennie V, Macfarlane PW, Mayne KJ, Mark PB, McConnachie A, McGeoch R, Nordin S, Payne A, Rankin AJ, Robertson K, Ryan N, Roditi G, Sattar N, Stobo D, Allwood-Spiers S, Touyz RM Veldtman Gruschen, Weeden S, Weir R, Watkins S, Welsh P, Mangion K, Berry C. Mental Health Symptoms and Illness Trajectory Following COVID-19 Hospitalization: A Cohort Study. *Heart and Mind*. 2023 7(4):235-245.
- Glen C, Morrow A, Roditi G, Hopkins T, Macpherson I, Stewart P, Petrie MC, Berry C, Epstein F, **Lang NN***, Mangion K*. Cardiovascular sequelae of trastuzumab and anthracycline in long-term survivors of breast cancer. *Heart*. 2023 Dec 16;heartjnl-2023-323437. doi: 10.1136/heartjnl-2023-323437 (*Joint senior author)
- Glen C, Adam S, Coats CJ, **Lang NN**. Reply: Cardiotoxicity of BRAF/MEK Inhibitors According to HFA/ICOS Cardiotoxicity Risk Category. *JACC CardioOncol*. 2023 Dec 19;5(6):850.
- Glen C, Adam S, McDowell K, Waterston A, Tan YY, Petrie MC, Coats CJ, **Lang NN**. Cardiotoxicity of BRAF/MEK Inhibitors: A Longitudinal Study Incorporating Contemporary Definitions and Risk Scores. *JACC CardioOncol*. 2023 Jun 6;5(5):628-637. doi: 10.1016/j.jacc.2023.04.004. eCollection 2023 Oct.
- Sidik NP, Stanley B, Sykes R, Morrow AJ, Bradley CP, McDermott M, Ford TJ, Roditi G, Hargreaves A, Stobo D, Adams J, Byrne J, Mahrous A, Young R, Carrick D, McGeoch R, Corcoran D, **Lang NN**, Heggie R, Wu O, McEntegart MB, McConnachie A, Berry C. Invasive Endotyping in Patients With Angina and No Obstructive Coronary Artery Disease: A Randomized Controlled Trial. *Circulation*. 2023 Oct 5. doi: 10.1161/CIRCULATIONAHA.123.064751. Online ahead of print.
- Henriksen PA, Hall P, MacPherson IR, Joshi SS, Singh T, Maclean M, Lewis S, Rodriguez A, Fletcher A, Everett RJ, Stavert H, Broom A, Eddie L, Primrose L, McVicars H, McKay P, Borley A, Rowntree C, Lord S, Collins G, Radford J, Guppy A, Williams MC, Japp A, Payne JR, Newby DE, Mills NL, Oikonomidou O, **Lang NN**. A multicenter prospective randomized controlled trial of high sensitivity cardiac troponin I-guided combination angiotensin receptor blockade and beta-blocker therapy to prevent anthracycline cardiotoxicity: the Cardiac CARE trial. *Circulation*. 2023(In Press).
- Mangion K, Morrow AJ, Sykes R, Kamdar A, Bagot C, Bruce G, Connelly P, Delles C, Gibson VB, Gillespie L, Barrientos PH, Lennie V, Roditi G, Sattar N, Stobo D, Allwood-Spiers S, McConnachie A, Berry C; CISCO-19 investigators. Post-COVID-19 illness and associations with sex and gender. *BMC Cardiovasc Disord*. 2023 Aug 8;23(1):389.
- Henriksen PA, Rankin S, **Lang NN**. Cardioprotection in Patients at High Risk of Anthracycline-Induced Cardiotoxicity. *JACC CardioOncol*. 2023 Jun 20;5(3):292-297.
- Yeoh SE, Osmanska J, Petrie MC, Brooksbank K, Clark AL, Doherty KF, Foley PWX, Guha K, Halliday C, Jhund P, Kalra P, **Lang NN**, Lee MMY, McConnachie A, McDermott JJ, Platz E, Sartipy P, Seed A, Stanley B, Weir R, Welsh P, McMurray JJV, Campbell RT. Dapagliflozin versus metolazone in patients with heart failure and loop diuretic resistance. *Eur Heart J*. 2023 Aug 14;44(31):2966-2977.
- Elyan BMP, Rankin S, Jones R, **Lang NN**, Mark P, Lees JS. Kidney Disease Patient Representation in Trials of Combination Therapy With VEGF-Signaling Pathway Inhibitors and Immune Checkpoint Inhibitors: A Systematic Review. *Kidney Med*. 2023 May 16;5(7):100672.
- Glen C, Adam S, McDowell K, Waterston A, Tan YY, Petrie MC, Coats CJ, **Lang NN**. Cardiotoxicity of BRAF/MEK Inhibitors: A Real-World Longitudinal Study Incorporating Contemporary Definitions and Risk Scores. *J Am Coll Cardiol:CardioOncology* 2023 (in press)

- Dobbin SJH, Shen L, Petrie MC, Packer M, Solomon SD, McMurray JJV, **Lang NN***, Jhund PS*. Characteristics and Outcomes of Patients with a History of Cancer Recruited to Heart Failure Trials. *Eur J Heart Fail.* 2023 Apr;25(4):488-496.
- Mooney L, Jackson CE, Adamson C, McConnachie A, Welsh P, Myles RC, McMurray JJV, Jhund PS, Petrie MC, **Lang NN**. Adverse outcomes associated with interleukin-6 in patients recently hospitalized for heart failure with preserved ejection fraction. *Circ Heart Fail.* 2023 Apr;16(4):e010051.
- Sykes R, Morrow, AJ, McConnachie A, Kamdar A, Bagot C, Bayes H, Blyth K, Briscoe M, Bulluck H, Carrick D, Church C, Corcoran D, Findlay I, Gibson V, Gillespie L, Grieve D, Barrientos P, Ho A, **Lang NN**, Lowe D, Lennie V, MacFarlane P, Mayne K, Mark P, McIntosh A, McGeoch R, McGinley C, Mckee C, Nordin S, Payne, A, Rankin A, Robertson K, Ryan N, Roditi G, Sattar N, Stobo D, Allwood-Spiers S, Touyz, R, Veldtman G, Weeden S, Watkins S, Welsh P, Wereski R, Mangion K, Berry C, Delles C. Adjudicated myocarditis and multisystem illness trajectory in healthcare workers post-COVID-19. *Open Heart* **10**, e002192 (2023).
- Mangion K, Morrow AJ, Sykes R, Kamdar A, Bagot C, Bruce G, Connelly P, Delles C, Gibson VB, Gillespie L, Hall Barrientos P, Lennie V, Roditi G, Sattar N, Stobo D, Allwood-Spiers S, McConnachie A, Berry C; CISCO-19 investigators. Post-COVID-19 illness and associations with sex and gender. *BMC Cardiovasc Disord.* 2023; 23(1):389. doi: 10.1186/s12872-023-03412-7.
- Cohen JB, Brown NJ, Brown SA, Dent S, van Dorst DCH, Herrmann SM, **Lang NN**, Oudit GY, Touyz RM. Cancer Therapy-Related Hypertension: A Scientific Statement From the American Heart Association. *Hypertension.* 2023 Mar;80(3):e46-e57.
- Bruhn J, Malmborg M, Garred C, Ravn P, Zahir D, Andersson C, Gislason G, Torp-Pedersen C, Kragholm K, Fosbol E, Butt JH, **Lang NN**, Petrie MC, McMurray JJV, Kober L, Schou M. Temporal trends in the incidence of malignancy and cancer free survival in patients with heart failure from 1997-2013: A nationwide study *Eur Heart J.* 2023 Apr 1;44(13):1124-1132.
- McGettrick M, Dormand H, Brewis M, Johnson MK, **Lang NN***, Church AC*. (2022) Cardiac geometry, as assessed by cardiac magnetic resonance, can differentiate subtypes of chronic thromboembolic pulmonary vascular disease. *Front Cardiovasc Med.* 2022 Dec 13;9:1004169. *Joint senior authors.
- Mayne KJ, Lees JS, Rutherford E, Thomson PC, Traynor JP, Dey V, **Lang NN***, Mark PB* (2022) Neutrophil-to-lymphocyte and platelet-to-lymphocyte ratios: associations with mortality in a haemodialysis cohort. *Clin Kidney J.* 2022 Nov 18;16(3):512-520. *Joint senior authors.
- Kalra PR, Cleland JGF, Petrie MC, Thomson EA, Kalra PA, Squire IB, Ahmed FZ, Al-Mohammad A, Cowburn PJ, Foley P, Graham FJ, Japp AG, Lane RE, **Lang NN**, Ludman AJ, Macdougall IC, Pellicori P, Ray R, Robertson M, Seed A, Ford I. A randomised trial of intravenous ferric derisomaltose in patients with heart failure and iron deficiency (IRONMAN). *Lancet.* 2022 Dec 17;400(10369):2199-2209.
- Mark PB, Mangion K, Rankin AJ, Rutherford E, **Lang NN**, Petrie MC, Stoumpos S, Patel RK. Left ventricular dysfunction with preserved ejection fraction: the most common left ventricular disorder in chronic kidney disease patients. *Clin Kidney J.* 2022 May 25;15(12):2186-2199.
- Lees JS, Dobbin SJH, Elyan BMP, Gilmour DF, Tomlinson LP, **Lang NN**, Mark PB. A systematic review and meta-analysis of the effect of intravitreal VEGF inhibitors on cardiorenal outcomes. *Nephrol Dial Transplant.* 2023 Jun 30;38(7):1666-1681.
- Lim MWS, Setjiadi, D, Dobbin SJH, **Lang NN**, Delles C, Connelly PJ. Nailfold video-capillaroscopy in the study of cardiovascular disease: a systematic review. *Blood Press Monit.* 2023 Feb 1;28(1):24-32.
- Desai AS, Jhund PS, Claggett BL, Vaduganathan M, Miao ZM, Kondo T, Barkoudah E, Brahim A, Connolly E, Finn P, **Lang NN**, McCausland FR, McGrath M, Petrie MC, McMurray JJV, Solomon SD. Association of

Dapagliflozin with Cause-Specific Mortality in Patients with Heart Failure Across the Spectrum of Ejection Fraction. A Participant-Level Pooled Analysis of DAPA-HF and DELIVER. *JAMA Cardiol.* 2022 Dec 1;7(12):1227-1234.

de Wit S, Glen C, de Boer RA, **Lang NN**. Mechanisms Shared Between Cancer, Heart Failure and Targeted Anti-Cancer Therapies. *Cardiovasc Res.* 2023 Feb 3;118(18):3451-3466.

Kalra PR, Cleland JGF, Petrie MC, Ahmed FZ, Foley PWX, Kalra PA, **Lang NN**, Lane RE, Macdougall IC, Pellicori P, Pope MTB, Robertson M, Squire IB, Thomson EA, Ford I. Rationale and design of a randomised trial of intravenous iron in patients with heart failure. *Heart.* 2022 Nov 24;108(24):1979-1985.

Henriksen PA, Hall P, Oikonomidou O, MacPherson IR, Maclean M, Lewis S, McVicars H, Broom A, Scott F, Mckay P, Borley A, Rowntree C, Lord S, Collins G, Radford J, Guppy A, Payne JR, Newby DE, Mills NL, **Lang NN**. Rationale and design of the Cardiac CARE trial: A multicenter randomized trial of troponin-guided beta adrenoceptor and angiotensin receptor blockade for the prevention of anthracycline-induced cardiotoxicity. *Circulation: Heart Fail.* 2022 Jul;15(7):e009445.

Morrow AJ, Sykes R, McIntosh A, Kamdar A, Bagot C, Bayes HK, Blyth KG, Briscoe M, Bulluck H, Carrick D, Church C, Corcoran D, Findlay I, Gibson VB, Gillespie L, Grieve D, Hall Barrientos P, Ho A, **Lang NN**, Lennie V, Lowe DJ, Macfarlane PW, Mark PB, Mayne KJ, McConnachie A, McGeoch R, McGinley C, McKee C, Nordin S, Payne A, Rankin AJ, Robertson KE, Roditi G, Ryan N, Sattar N, Allwood-Spiers S, Stobo D, Touyz RM, Veldtman G, Watkins S, Weeden S, Weir RA, Welsh P, Wereski R; CISCO-19 Consortium, Mangion K, Berry C. Multisystem, cardio-renal investigation of post-covid illness. *Nature Medicine.* 2022 Jun;28(6):1303-1313.

Welsh P, Campbell RT, Mooney L, Kimenai D, Hayward C, Campbell A, Porteous D, Mills NL, **Lang NN**, Petrie MC, McMurray JJV, Sattar N. Reference ranges for NT-proBNP and risk factors for higher NT-proBNP concentrations in a large general population cohort. *Circulation:Heart Failure* 2022; 13:101161. doi: 10.1161

Lee MM, Gillis K, Brooksbank K, Allwood-Spiers S, Hall-Barrientos P, Wetherall K, Roditi G, AlHummiyany B, Berry C, Campbell RT, Chong V, Coyle L, Docherty K, Dreisbach J, Kuehn B, Labinjoh C, **Lang NN**, Lennie V, Mangion K, McConnachie A, Murphy C, Petrie C, Petrie J, Sharma K, Sourbron S, Speirits I, Thompson J, Welsh P, Woodward R, Wright A, Radjenovic A, McMurray JJV, Jhund PS, Petrie MC, Sattar N, Mark PB. Effect of Empagliflozin on Kidney Biochemical and Imaging Outcomes in Patients with Type 2 Diabetes, or Prediabetes, and Heart Failure with Reduced Ejection Fraction (SUGAR-DM-HF). *Circulation.* 2022 Jul 26;146(4):364-367.

McGettrick M, **Lang NN**, Church AC. Contemporary Imaging in Chronic Pulmonary Thromboembolic Disease. *Hypertension J* 2021;7(3): 142-148.

Crowe K, **Lang NN**, Mark PB. Intravitreal Antivascular Endothelial Growth Factor-Driven Deterioration in Proteinuria, Renal Function, and Hypertension in the Context of Diabetic Nephropathy: A Case Report (Case Report). *Hypertension J* 2021;7(3): 153-156.

Glen C, Tan YY, Waterston A, Evans, TRJ, Jones R, Petrie MC, **Lang NN**. Cardiovascular toxicity of BRAF and MEK inhibitors in patients with cancer: mechanistic and clinical overview. *JACC: CardioOncology* 2022;4(1):1-18

Lees JS, Elyan BMP, Hermann SM, **Lang NN**, Jones RJ, Mark, PB. The 'other' big complication: how chronic kidney disease impacts on cancer risks and outcomes. *Nephrology Dialysis Transplantation* (2022) (doi: 10.1093/ndt/gfac011. Online ahead of print.

Lang NN, Touyz RM. Mechanistic science in cardiovascular-oncology: the way forward to maximise anti-cancer drug effects and minimise cardiovascular toxicity. *Clin Sci (Lond).* 2021 Dec 10;135(23):2661-2663.

- Herrmann J, Lenihan D, Armenian S, Barac A, Blaes A, Cardinale D, Carver J, Dent S, Ky B, Lyon AR, LópezFernández T, Fradley MG, Ganatra S, Curigliano G, Mitchell JD, Minotti G, **Lang NN**, Liu JE, Neilan TG, Nohria A, O'Quinn R, Pusic I, Porter C, Reynolds KL, Ruddy KJ, Thavendiranathan P, Valent P. Universal Definition of Cardiovascular Toxicities of Cancer Therapies - An International Cardio-Oncology Society (IC-OS) Consensus Statement. *Eur Heart J*. 2022;43(4):280-299.
- Lees JS, Ho F, Parra-Soto S, Celis-Morales C, Welsh P, Sullivan MK, Jani BD, Sattar N, **Lang NN**, Pell JP, Webster AC, Mark PB. Kidney function and cancer risk: An analysis using creatinine and cystatin C in a cohort study. *EClinicalMedicine*. 2021;38:101030.
- McGettrick M, MacLellan A, McCaughey P, Bagot C, Brewis MJ, **Lang NN**, Johnson MK, Church AC. Pulmonary thromboembolism in hospitalised patients with COVID-19: a retrospective national study of patients managed in critical care and ward environments in Scotland. *BMJ Open*. 2021;11(8):e050281.
- Noh RM, Graveling AJ, **Lang NN**, White AC, Lee KK, Mills NL, Newby DE, Lang CC, Frier BM. Effect of hypoglycaemia on measures of myocardial blood flow and myocardial injury in adults with and without type 1 diabetes: A prospective, randomised, open-label, blinded endpoint, cross-over study. *Endocrinol Diabetes Metab*. 2021;4(3):e00258.
- Rush CJ, Berry C, Oldroyd KG, Rocchiccioli JP, Lindsay MM, Touyz RM, Murphy CL, Ford TJ, Sidik N, McEntegart MB, **Lang NN**, Jhund PS, Campbell RT, McMurray JJV, Petrie MC. Prevalence of Coronary Artery Disease and Coronary Microvascular Dysfunction in Patients With Heart Failure With Preserved Ejection Fraction. *JAMA Cardiol*. 2021 doi: 10.1001/jamacardio.2021.1825.
- Mooney L, Goodyear CS, Chandra T, Kirschner K, Copland M, Petrie MC, **Lang NN**. Clonal haematopoiesis of indeterminate potential: intersections between inflammation, vascular disease and heart failure. *Clin Sci (Lond)* 2021;135(7):991-1007.
- Kalantar-Zadeh K, Schwartz GG, Nicholls SJ, Buhr KA, Ginsberg N, Johansson JO, Kulikowski E, Lebioda K, Toth PP, Wong N, Sweeney N, Ray KK. BETonMACE Investigators Effect of Apabetalone on Cardiovascular Events in Diabetes, CKD, and Recent Acute Coronary Syndrome: Results from the BETonMACE Randomized Controlled Trial. *Clin J Am Soc Nephrol*. 2021;16(5):705-716
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Dobbin SJ, Cameron AC, Petrie MC, Jones RJ, Touyz RM, **Lang NN**. Cardiovascular Toxicity of Cancer Therapy: What the Cardiologist Needs to Know about Tyrosine Kinase Inhibitors of Angiogenesis *Heart* 2018;104(24):1995-2002.

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BOOK CHAPTERS

Dobbin SJH, Herrmann S, **Lang NN**, Herrmann J, Touyz RM. Hypertension and Renal Disease Prevention: Before Cancer Therapy. In: *Herrmann Cardio-Oncology Practice Manual. A Companion to Braunwald's Heart Disease*. Ed: Herrmann J. 2021. Elsevier.

Herrmann S, Dobbin SJH, Herrmann J, Touyz RM, **Lang NN**. Hypertension and Renal Disease During Anti-Cancer Therapies. In: *Herrmann Cardio-Oncology Practice Manual. A Companion to Braunwald's Heart Disease*. Ed: Herrmann J. 2021. Elsevier.

Lang NN, Dobbin SJH, Herrmann S, Touyz RM, Herrmann J. Hypertension and Renal disease with Anti-Cancer Therapies: Management after therapy. In: *Herrmann Cardio-Oncology Practice Manual. A Companion to Braunwald's Heart Disease*. Ed: Herrmann J. 2021. Elsevier.

Dobbin SJH...**Lang NN** Cardiovascular Oncologic Emergencies. In: *Oncologic Emergency Medicine – Principles and Practice*. Eds: Todd KH, Thomas CR, Alagappan K. 2021. Springer.

Cameron AC, Touyz RM, **Lang NN**. Vascular Biology of Chemotherapeutic Drugs. In: *Textbook of Vascular Medicine*. Eds: Touyz R, Delles C. 2019. Springer.

Cameron AC, Rossitto G, **Lang NN**, Touyz RM. Anti-Hypertensive Drugs and Vascular Health. In: *Prehypertension and Cardiometabolic Syndrome*. Eds: Zimlichman R, Julius S, Giuseppe M. 2017. Springer

Cameron AC, **Lang NN**, Touyz RM. Hypertension – focus on VEGF inhibitors. In: *Clinical Cardio-Oncology*. Ed. J Herrmann. 2016. Elsevier.

Lang NN, Payne JR. Heart Failure Resistant to Standard Medical Therapy. In: *Oxford Specialist Handbook of Cardiothoracic Intensive Care*. Eds. Smith R, Higgins M, Macfie A. 2014. Oxford University Press, UK.

Lang NN, Newby DE. Assessment of Patients with Suspected Chronic Heart Failure. In: *Oxford Medical Library: Chronic Heart Failure*. Ed; Kearney, M. 2008. Oxford University Press, UK.

CLINICAL TRIAL SAFETY REVIEW COMMITTEE

CV6 Therapeutics: Cardiovascular Safety Review Consultancy. A First-in-Human Modular, Open-label, Phase I/IIa Study to Evaluate the Safety, Tolerability, Pharmacokinetics and Anti-tumour Activity of the specific dUTPase inhibitor CV6-168 in Combination with Anti-cancer Treatments in Patients with Advanced Malignancies.

CLINICAL ENDPOINT ADJUDICATION COMMITTEES

GSK 219112 (MRNA CLINRES-001) (*GlaxoSmithKline Biologicals SA*)

SYNCHRONIZE: BI45906 Programme (Survodutide) (*Boehringer Ingelheim*)

REVIVED-BCIS2: Revascularisation for Ischaemic Ventricular Dysfunction (*NIHR*)

FINEARTS: Finerenone Trial to Investigate Efficacy and Safety Superior to Placebo in Patients with Heart Failure (*Bayer*)

DELIVER: An International, Double-blind, Randomised, Placebo-Controlled Phase III Study to Evaluate the Effect of Dapagliflozin on Reducing CV Death or Worsening Heart Failure in Patients with Heart Failure with Preserved Ejection Fraction (HFpEF) (*Astra Zeneca*)

EXPLORER-HCM: A Randomized, Double-blind, Placebo-controlled Clinical Study to Evaluate Mavacamten (MYK-461) in Adults with Symptomatic Obstructive Hypertrophic Cardiomyopathy (*Myokardia, Inc.*)

A Phase 2B/3, Randomized, Double-Blind, Placebo-Controlled Study Evaluating the Safety and Efficacy of Efruxifermin in Non-Cirrhotic Subjects with Nonalcoholic Steatohepatitis (NASH) (*Akero*)

BETonMACE: A Phase III multi-center, double-blind, randomized, parallel group, placebo-controlled clinical trial in high-risk type 2 diabetes mellitus (T2DM) subjects with coronary artery disease to determine whether treatment with RVX000222 increases the time to major adverse cardiovascular events. (*Resverlogix*)

MULTICENTRE CLINICAL TRIALS

UK Chief Investigator:

STANDUP-Imaging: A Multicenter, Randomized, Double-Blind, Placebo- and Active-Controlled, Cross-over Phase 2 Study of Continuous 5-Hour Intravenous Infusions of BMS-986231 in Patients with Heart Failure and Impaired Systolic Function

UK Chief Investigator:

STANDUP-AHF: (Study Assessing Nitroxyl Donor Upon Presentation with Acute Decompensated Heart Failure; Bristol-Myers Squibb)

Local Principal Investigator/Grant Co-Applicant/Senior Author:

Cardiac CARE: A multicentre prospective randomised open-label blinded end-point controlled trial of high-sensitivity cardiac troponin I-guided combination angiotensin receptor blockade and beta blocker therapy to prevent cardiac toxicity in breast cancer patients receiving anthracycline adjuvant therapy (NIHR/BHF)

Local Principal Investigator:

IRONMAN: Effectiveness of Intravenous iron treatment vs standard care in patients with heart failure and iron deficiency: a randomised, open-label multicentre trial (IRONMAN) (Pharmacosmos/British Heart Foundation)

Investigator:

SPIRE: Studies of PCSK9 Inhibition and the Reduction of vascular Events (Pfizer)

RELAX-2 AHF: Relaxin in in Acute Heart Failure (Novartis)

Assurity CRT-P New Technology Assessment (ASSURITY; St. Jude Medical) Ellipse Assura ICD/CRT-D with Parylene Coating New Technology Assessment (ELIPSE ASSURA; St Jude Medical)

RELIANCE 4-FRONT Defibrillation Lead Post Market Clinical Follow-Up Study (RELIANCE-4; Boston Scientific)

ALternate Site Cardiac ReSYNChronization (ALSYNCR; Medtronic)

Safety and Efficacy Study of Tendril MRI™ Leads in Standard Bradycardia Pacing Indication (TENDRIL; St Jude Medical)

Evaluation of Multisensor Data in Heart Failure Patients With Implanted Devices (MultiSENSE; Boston Scientific)

Substrate and Trigger Ablation For Reduction of Atrial Fibrillation Trial – Part II (STAR-AF II; St Jude Medical)

The Dual Antiplatelet Therapy Study (DAPT Study)

The Effects of PSI-697 Upon Platelet Interactions in Smokers (Wyeth)

Metabolic Efficiency with Ranolazine for Less Ischemia in Non-ST Elevation Acute Coronary Syndromes (MERLIN – TIMI36; CV Therapeutics)

The Thrombin Receptor Antagonist for Clinical Events Reduction Trial (TRACER; Merck)

A Phase I, Randomized, Placebo-Controlled, Crossover Clinical Trial to Assess the Safety of Oral SRT2104 and its Effects on Vascular Dysfunction in Otherwise Healthy Cigarette Smokers and Subjects with Type 2 Diabetes Mellitus (Sirtris Pharmaceuticals, Inc)

INVITED LECTURES

Cardiotoxicity of Cancer Drugs: Do we really know how (un)common it is? MD Anderson Cancer Center, Texas, USA, Cardiology Grand Rounds, Online, November 2023

Microvascular Dysfunction: Implications for Cardio-Oncology COVADIS (Coronary Vasomotor Disorders International Study Group) XI Symposium, Amsterdam, September 2023

Cardiotoxicity: What do the Guidelines Tell Us? 28th Nordic-Baltic Cardiology Congress, Reykjavik, Iceland, June 2023

Clinical Research in Oncology: Models of Organization OncoT3 - Clinical Research in Oncology: from inspiration to practice. Lisbon/Online, May 2023.

Platinum-Based Chemotherapy: Late Cardiovascular Effects. National Germ Cell Group Annual Conference, Royal College of Physicians and Surgeons, Glasgow, April 2023.

Complications from Contemporary Cancer Treatments. St Andrews Day Symposium, Royal College of Physicians, Edinburgh, November 2022.

Biomarkers in Cardio-Oncology. proCardio Forum, Munich, October 2022.

Cardio-Oncology: ESC Guidelines. Scottish Cardiac Society, Autumn Meeting, Dunblane, Scotland. September 2022.

Cardiac Dysfunction Related to Cancer Therapy: Diagnosis and Prognostication. European Society of Cardiology Congress, Barcelona, Spain. August 2022.

Hypertensive Effects of Cancer Therapies: Treatment Options and Avoidance of End-Organ Effects. International Cardio-Oncology Society Webinar. July 2022.

Hypertensive Effects of Newer Cancer Therapies. UK Kidney Week Conference, Birmingham, UK. June 2022
Cardiotoxicity. British Society for Heart Failure, Training Meeting. Glasgow, May 2022.

Problems with current methods of endpoint capture. Cardiac Safety Research Consortium Think-Tank: CV Safety in Oncology Trials (online; international). December 2021.

Vascular Effects of Anti-Cancer Therapies. British and Irish Hypertension Society, Annual Scientific Meeting, Brighton. September 2021.

Cardiovascular Effects of Anti-Cancer Drugs. International Society of Hypertension/European Society of Hypertension Joint Meeting. Online. April 2021.

Cardio-Oncology. *Heart Failure Excellence Exchange Meetings.* University of Glasgow, bi-monthly video presentation to large and diverse international audiences, in association with Astra Zeneca, Jan – Dec 2020

Cardio-Oncology: Where Worlds Collide and Collaborate. Cardiovascular Grand Rounds, Mayo Clinic, Florida, January 2020.

Cancer and the Heart. Ensuring Success in Heart Failure Annual Conference, Royal College of Physicians and Surgeons of Glasgow, January 2020.

Cardio-Haem-Oncology. West of Scotland Haemato-oncology Managed Clinical Network, Glasgow, January 2020.

Anthracycline Cardiotoxicity: Clinical Context and Translational Gaps. Physiological Society Annual Conference, Aberdeen, July 2019

Update in Cardio-Oncology. Northern Ireland Spring Heart Failure Meeting, Belfast, June 2019

Cardio-Oncology and Renal Cancer Therapy. *Shared Experience of Metastatic Renal Cancer Management.* Edinburgh, April 2019

Multiple Myeloma and Cardiac Co-Morbidity. Dubai, United Arab Emirates, September 2018

Cardiovascular Disease in Oncology - New Treatments, New Problems. UK Kidney Week, Harrogate, June 2018

Translational Heart Failure Research. *Exchange Meeting in a Cardiology Centre of Excellence: New Insights Into Chronic Heart Failure Management.* University of Glasgow (2017 - present [recurring])

Cardio-Oncology: A New Challenge. *Exchange Meeting in a Cardiology Centre of Excellence: New Insights Into Chronic Heart Failure Management.* University of Glasgow (2017 - present [recurring])

Cardio-Oncology: Out of the Frying Pan and into the Fire? West of Scotland Heart Failure Update Meeting, Glasgow, March 2018

We're Fixing the Cancer - Job Done? A Cardiologist's Perspective. 'The Changing Face of Cancer' Symposium, Royal College of Physicians and Surgeons of Glasgow, February 2018

Cardio-Oncology. Beatson West of Scotland Cancer Centre, December 2017

Translational Cardiovascular Research in Glasgow. Public Lecture, Queen Elizabeth Univ Hospital, March 2017

Anti-VEGF Treatment and Hypertension - Clinical Implications. American Heart Association Annual Scientific Sessions, New Orleans, November 2016

Heart Failure for General Medics. Core Medical Training Day, West of Scotland Deanery, Glasgow, January 2016

Implanted Devices for Patients with Heart Failure. Heart Failure Nurse Training Event, Glasgow, January 2016

CRT, ICDs and Implanted Monitors: Where Next? British Society for Heart Failure 17th Annual Autumn Meeting, London, November 2014

'First into Human' Trial Process. MSc Translational Medicine, University of Edinburgh, November 2014

ICDs, CRT and LVADs. Queen Margaret College Diploma in Cardiology, April 2014

Acute Heart Failure. Edinburgh Cardiology Trainees' Meeting, March 2014

Devices in Heart Failure. Edinburgh Cardiology Trainees' Meeting, February 2014

Heart Failure for General Medical Trainees. Glasgow, January 2014

Acute Heart Failure for Intensivists. Scottish Intensive Care Society Meeting, November 2013

ABC of ICDs. General Medical Training Day, Royal College of Physicians and Surgeons, Glasgow, 2012

'First into Man' Pharmacology Workshop. MSc Translational Medicine, University of Edinburgh, November 2012

Assessment of Human Endothelial Function. MSc Pharmacology Course, University of Edinburgh, November 2010

Connexins: Gaps in Human Vascular Function. Centre for Cardiovascular Science, Edinburgh, June 2010

Cardiovascular Biology. MSc Pharmacology Course, University of Edinburgh, June 2009

Iron Oxide-Labeling of Mononuclear Cells in Man. Scottish Centre for Regenerative Medicine, June 2007

MRI Cell Stem Cell Tracking. Cardiovascular Stem Cell Group, University of Edinburgh, June 2006

Heart Failure Masterclass for Advanced Nurse Practitioners. Edinburgh, 2006

Pacemakers and ICDs. Edinburgh for Queen Margaret College Diploma in Cardiology for Post-Registration Nurses

RESEARCH/EDUCATIONAL SUPERVISION

- PhD:** Mr. Conor Crichton, University of Glasgow Vet School, Co-Supervisor
Cardio-oncology research in Veterinary Medicine: Anti-VEGF Tyrosine Kinase Inhibitors and adverse cardiac remodelling in dogs.
Commenced January 2023
- Dr. Benjamin Elyan, University of Glasgow, Second Supervisor
Cardio-Renal Effects of Angiogenesis Inhibitors in Patients with Cancer
Commenced February 2022
- Dr. Steven Rankin, University of Glasgow, Primary Supervisor
Pro-Inflammatory Atherogenic Effects of Immunotherapy and Angiogenesis Inhibitors
Commenced May 2022
- Dr. Claire Glen, University of Glasgow, Primary Supervisor
Biomarker and Imaging Characterisation of BRAF and MEK Inhibitor-Induced Cardiovascular Toxicity
Commenced February 2021
- Dr. Leanne Mooney, University of Glasgow, Primary Supervisor
Clonal Haematopoiesis and Inflammation in Patients with Heart Failure
Commenced August 2019
- Dr. Stephen J Dobbin, University of Glasgow, Primary Supervisor
Prospective Characterisation of the Adverse Cardiac and Vascular Effects of Angiogenesis Inhibitors in the Treatment of Cancer
PhD Awarded March 2023
- Dr. Carly Adamson, University of Glasgow, Co-Supervisor
Application of novel machine learning to cardiovascular prediction
PhD Awarded Sept 2023
- Dr. Alan C Cameron, University of Glasgow, Co-Supervisor
Clinical characterisation of the adverse cardiovascular effects of cancer chemotherapeutics
PhD Awarded October 2019
- MD:** Dr. Sowmya Venkatasubramanian, University of Edinburgh, Co-supervisor
Cardiovascular Effects of The Sirtuin and Urocortin Systems in Humans
MD Awarded 2016
- Dr. Michael McGettrick, University of Glasgow, Co-Supervisor
Iodine mapping in the diagnosis and assessment of functional limitation in patients with chronic thromboembolic disease.
MD Awarded March 2024
- MSc (Res):**
Dr. Faheem Ahmad, University of Glasgow, Co-Supervision with Prof MC Petrie
Clinical Assessment of the Cardiovascular Effects of a Nitroxyl Donor in Patients with Heart Failure
Awarded February 2020
- Advanced Nurse Practitioner MSc; mentor to:*

Ms. Louise Grant, Edinburgh Napier University
Mrs. Valerie O'Neill, Glasgow Caledonian University

Non-Medical Prescribing MSc; mentor to:
Mrs. Lorna Rinkus, University of Stirling

Selected Undergraduate/Clinical:

Intercalated BSc:

Mark Hall, University of Glasgow (1st class Honours; Pharmacology)

Special Studies Component (SSC):

Approx. 35 students to date (University of Glasgow and University of Edinburgh)

Carnegie Scholarship Award Supervision:

Ms Julia Turner

Regular bedside teaching (Year 3 MB ChB)

Clinical hosting: elective students, work experience pupils and allied health professionals