



2025

KARNATAKA RADIOLOGY EDUCATION PROGRAM

CLINICAL RESEARCH – BRIDGING IMAGING & INNOVATION

SESSION – 3 – RESEARCH QUESTION (II)



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PICOT MODEL FOR RESEARCH QUESTION DEVELOPMENT

✓ P – PATIENT / POPULATION / PROBLEM

✓ I – INTERVENTION / EXPOSURE / PROGNOSTIC FACTOR

✓ C – COMPARISON (OPTIONAL)

✓ O – OUTCOME

✓ T – TIME

✓ EXAMPLE: FOR DIAGNOSTIC STUDY

✓ ARE (IS) _____ (I) MORE ACCURATE IN DIAGNOSING _____ (P) COMPARED WITH _____ (C) FOR _____ (O)?

✓ IS THE *DYNAMIC CONTRAST MRI* IS MORE ACCUARTE IN DIAGNOSING *BUDD-CHIARI SYNDROME* COMPARED WITH *ULTRASOUND LIVER DOPPLER*?

ALTERNATE MODELS FOR RESEARCH QUESTION DEVELOPMENT

Model	Components	Description			
PECO	Population	Environment	Comparison	Outcome	Similar to PICO but focuses on the effect of exposure to something (e.g., smoky atmosphere)
SPICE	Setting	Population	Intervention	Comparison	Evaluation
CIMO	Context	Intervention	Mechanisms	Outcome	Suitable for management and organization studies

RESEARCH QUESTION – MYTHS & REALITY

MYTHS	REALITY
SHOULD BE COMPLEX	SHOULD BE SIMPLE, CLEAR , NOVEL, RELEVANT
EXCLUSIVELY INVOLVE IMAGING STUDIES	CLINICAL-RADIOLOGICAL-PATHOLOGICAL COLLABORATION ENHANCE THE STUDY SCOPE
EXPERT MEANS SENIOR IN THE RADIOLOGY DEPARTMENT	INTERDEPARTMENTAL & INTERSECTORAL (IT/TECHNOLOGISTS) COLLABORATION MAKES THE IDEA STRONG
IF I SHARE IDEAS, MY COLLEAGUES WILL STEAL & PUBLISH	MULTIPLE MINDS REFINE THE QUESTION AND ADD CLARITY
SOLO CONTRIBUTION MAKES ME FAMOUS	TEAM WORK IS THE KEY FOR SUCCESSFUL RESEARCH
NOT BEING MINDFUL ABOUT FEASIBILITY	NON-FEASIBLE STUDY IDEAS RUIN TIME, RESOURCES & EFFORTS
ONLY WE CAN RESEARCH IN ADVANCED IMAGING FIELDS	KEEP MIND OPEN TO FIND TRUTH IN EACH & EVERY ASPECT OF CLINICAL PRACTICE
FLOWERY LANGUAGE ATTRACTS REVIEWERS & EDITORS	DIFFICULT WORDS/ IDIOMS IRRITATES REVIEWERS
CATCHY TITLE MATTERS	SCINTIFICALLY DESIGNED TITLE – WHAT REVIEWER LOOKS FOR
ONLY EXPERTS’/SENIORS’ QUESTIONS ARE VALUED	INNOVATIVE IDEA IS ALWAYS VALUED

QUIZ

SCENARIO

CURRENT PRACTICE – TRIPLE PHASE CECT/ MRI ABDOMEN FINDINGS OF HEPATIC MASS SHOWING NON-RIM ARTERIAL PHASE HYPER-ENHANCEMENT WITH PORTAL VENOUS WASHOUT – DIAGNOSTIC CRITERIA FOR HEPATOCELLULAR CARCINOMA.

RESEARCH GAP – IS THERE ANY ROLE OF BIOPSY IN HEPATOCELLULAR CARCINOMA PATIENTS?

HYPOTHESIS – PROGNOSIS OF THE HEPATOCELLULAR CARCINOMA DEPENDS ON GENETIC MAKE-UP OF THE TUMOUR CELLS.

QUESTION – WHAT IS/ARE THE RESOURCES FOR CONFIRMING THE RESEARCH GAP?

ANSWER - EDITORIALS



World Journal of
Gastroenterology

EDITORIAL ▶ World J Gastroenterol. 2007 Apr 28;13(16):2271–2282. doi: [10.3748/wjg.v13.i16.2271](https://doi.org/10.3748/wjg.v13.i16.2271)

Genetics of hepatocellular carcinoma

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PMCID: PMC4147134 PMID: [17511024](#)

Abstract

The completely assembled human genome has made it possible for modern medicine to step into an era rich in genetic information and high-throughput genomic analysis. These novel and readily available genetic resources and analytical tools may be the key to unravel the molecular basis of hepatocellular carcinoma (HCC). Moreover, since an efficient treatment for this disease is lacking, further understanding of the genetic background of HCC will be crucial in order to develop new therapies aimed at selected targets. We report on the current status and recent developments in HCC genetics. Special emphasis is given to the genetics and regulation of major signalling pathways involved in HCC such as p53, Wnt-signalling, TGF β , Ras, and Rb pathways. Furthermore, we describe the influence of chromosomal aberrations as well as of DNA methylation. Finally, we report on the rapidly developing field of genomic expression profiling in HCC, mainly by microarray analysis.

THANK YOU

