



SCUT Newsletter

Abstract

Raman spectra are often masked by strong fluorescence, which severely hinders the applications of Raman spectroscopy. Herein, for the first time, we report ionic-wind-enhanced Raman spectroscopy (IWERS) incorporated with photobleaching (PB) as a noninvasive approach to detect fluorescent and vulnerable samples without a substrate. In this study, ionic wind (IW) generated by needle-metal electrode transfer charges to the sample surface in air on the scale of millimeters rather than nanometers as surface-enhanced Raman spectroscopy. Density functional theory calculations reveal that the ionic particles in IW increase the susceptibility of the sample molecules, thus enhancing the Raman signals. Meanwhile, the incorporation of IW with PB yields a synergistic effect to quench fluorescence. Therefore, this approach can improve the signal-to-noise ratio of Raman peaks up to three times higher than that with only PB. At the same time, IWERS can avoid sample pollution and destruction without substrates as well as high laser power. For archaeological samples and a red rock as an analogue to Mars geological samples, IWERS successfully identified weak but key Raman peaks, which were masked by strong fluorescence. It suggests that IWERS is a promising tool for characterizations in the fields of archaeology, planetary science, food medicine, and so on.

1. Analytical and Testing Center of South China University of Technology (SCUT) and other Institutes Propose an Original Enhancement Method for Raman Spectroscopy

2Q -DQXDUI\ D SD80UF V LQ@HQQKDQFHG 5DPDQ 6SHFWURVFRSI
6XEUVWZDWHSXEOLVKHG LQ \$QDOIWLFDQ &KHPQLDQWLFDQOTKBSBLQMMW
DXWKRU DQG FRUUHVSRRQLQJ DXWKRU RI WKH SDSHU LV /LDQJ 4LQ
DQG 7HVWLQJ &HQWHU ZLWK FRUUHVSRRQLQJ DXWKRUV 3URI *

6&87 V 6FKRRO RI 0DWHULDOV 6FLHQFH DQG (QJLQHULQJ DV ZHOODQG 7HVWLQJ &HQWHU 7KH FRODERUDWLYH LQVWLWXWHV LQFOXGH WKH 1DWLRQDO 0XVHXP RI &KLQD

8] 7: êÜL5 , RQLF ZLQG HODVDQF HFWUHV WKHQMDQFHQWUDWHV(#[8&sk,»iÜ)
4iëOü#_C¾ \$QDO&WHPDOWU\%&Y½ s8•liKË3e8ñL• U ±QZ"Ñao ±QZ •#[8â>]* ,1 9Ö/Ü ml-Oü/:K`
/] ê"Æ%aa0] ±QZ •8¥6îK&,» c/:K` ,»g-pi?-%p6@4Ý caè7z8i6@4Ý r#[8â> ]\* ,1 8½^yf`6@4ÝOü!-Oü/:K`
/] ê%] ±\$ª ¢\$Z4AZÔ?«*],» r , -Æ*],» r , (R(R- \$C¾jÜLž s

5DPDQ VFDWWHULQJ LV D QRQ HODVWLF VFDWWHULQJ SKHQRPHQREHWZHHQ LQFLGHQW SKRWRQV DQG GLIIHUHQW YLEUDWLRQDO PRVSHFWURVFRS\ 6XFK VSHFWURVFRS\ LV YHU\ VHQVLWLYH WR WKH FDQ HIIHFWDWHVWHULJH WKH PROHFXODU VWUXFWXUHWHHQGXPHQDQDQG WHPSHUDWXUH +RZHYHU GXH WR WKH IDFW WKDW WKH LQVWLWXGH ORZHU WKDQ IOXRUVFHQFH 5DPDQ VSHFWUD DUH RIVLQG HQKDQFHG 5DPDQ VSHFWURVFRS\ ,:(56 FDQ VLJQLILFDQWO5DPDQ SHDNV ZKLOH DFKLHYLQJ WRWDOO\ QRQ GHVWUXFWLYH QRGHWHFWLRQ PHHWLQJ WKH VWULQJHQW UHTXLUPHQWV RI FXWVWRWKH 5DPDQ VSHFWUD WRROER[7KH ,:(56 PHWKRQ KDV H[WHQVLYHWR SOD\ DQ LPSRUWDQW UROH LQ ILHOGV VXFK DV DUFKDHRORJ\ S

4 8Q6,-Y æ 5 D P D Q F D W W H U L Q J ç7,,"žGÜ UK"h³0ž1[6,-YE]¶ ê"°-Y"ž,¥ c9CE& #[,¥ b%a4,,"ý;v0d gl ù4-
b%aRRc\$ #Qa0.3e4 8Q"ž]† æ 5 D P D Q V S H F W U R V F R S \ ç s4 8Q"ž]†-N ã#[,¥glGÜh³8Ö1[4,,"ýh³/•6æ2t è9
6•Y½0Ö#[,¥P(8Ü ê '°D> c\$/é#ð r?~ÜLžC¾E[% 6Å s >F† ã4 8Q"žGÜ0-/Ü=)T¼"ž £*Ö#5 •6Åc\$Oü ê(5<14
8Q"ž]†%,T¼"žGÜ/C¾Åh³/• zc" sK ,¥j#)ó0•4 8Q"ž]† æ , RQLF ZLQG HQKDQFHFWURVFRS\
,:(56 ç%D :({7"U-5%l-4 8Q]†.E!6'¿=)GÜ%a7K ê,6E ,á"½754' r75=¶9(r754ú[;GÜ4 8Q"ž]†: > ê@6_
#¢> iÜ)4GÜT0#•ZÖ=— ê #Qa •4 8Q"ž]†GÜ/:"IM 5% ð Ü7 GÜ/:"i s ,:(567 >*8^/Ö>0/éF}GÜ@±#ð ê8^8p({
6ÜC¾QX%9 rYj7tK&,» rFtC¾\$•,» r`ÄC¾^}LžÜ)4%&4zc"ZÖ ±F} s



nature cardiovascular research

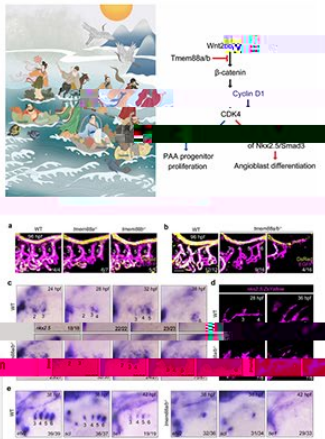
Article <https://doi.org/10.1038/s44161-023-00215-z>

Tmem88 confines ectodermal Wnt2bb signaling in pharyngeal arch artery progenitors for balancing cell cycle progression and cell fate decision

Received: 1 March 2022
Accepted: 6 January 2023
Published online: 02 February 2023
[Check for updates](#)

Mingming Zhang¹, Jie Liu¹, Aihua Mao¹, Guozhu Ning¹, Yu Cao¹,
Wang Qiang¹✉

Pharyngeal arch artery progenitors undergo proliferative expansion and angioblast differentiation to build vessels connecting the heart with the dorsal aortae. However, it remains unclear whether and how these two processes are orchestrated. Here we demonstrate that Tmem88 is required to fine-tune PAA progenitor proliferation and differentiation.



2. Prof. Wang Qiang and His Team from SCUT Elucidate the Regulatory mechanism

underlying the Balance Control of the Heart and Angioblast Differentiation of Arch Artery Progenitor Cells

2Q)HEUXD\UHVHDWFD 4LDQJ IWRBFKRRORHGLFRQ 87
SXEOLD\BGRQOHQVLW



3. SCUT Attends Third Meeting of China-South Africa High-level People-to-People Exchange Mechanism and Signs Cooperation Agreements

2Q)HEUXDU\ WKH WKLUG PHHWLQJ RI &KLQD 6RXWK \$IULFD +
0HFKDQLVP ZDV KHOG LQ &DSH 7RZQ 6RXWK \$IULFD 6&87 3DUW\ 6
KLV GHOHJDWLRQ ZDV LQYLWHG WR DWWHQG WKH PHHWLQJ LQ 6RX

8] 7: ê,\$-l-Où#€ 6Ü ù>-8•#<L• ^<v o] {j\$-h³0U7Ã6» “#ó ê\$E\$-E[/:*,>”+) »] L5Bî7z/éaÖDÜ
(7#t0Ö\$-h³% #ö o] s

'XULQJ KLV YLVLW =KDQJ ;LFKXQ KHOG TXDGULSDUWLWH WDONV Z
0XVLQD 0DNKDGR 6SHFLDO (FRQRPLF =RQH 006(= 6RXWK \$IULFDQ
DQG 6RXWK \$IULFDQ 3ODWL6WRQH +ROGLQJV 3W\ /WG ZLWK D PH
EXLOGLQJ WKH *UHHQ +LJK 3HUIRUPDQFH \$VSKDOW 0DWHULDO 5 ' ,
ZLWK WKH 0DQDJHPHQW &RPPLWWHH RI 0XVLQD 0DNKDGR 6SHFLDO
\$IULFDQ (QHUV\ 0HWD00XUJLFD0 %DVH 3W\ /WG ZLWK D PHPRU
EXLOGLQJ WKH (GXFDWLRQ DQG 6FLHQWLILF 5HVHDUFK 3DUN 3URM
WR FRRSHUDWLRQ RQ WKH WZR SDUNV 7KH SUDJPDWLF DQG GLVV
UHVHDUFK EHWZHHQ 6&87 DQG 6RXWK \$IULFD KDYH ZRQ VSHFLDO V>

] gC8tgi êL5Bî7z cK>/aP kÁ\$¶/ûP\$>£Cî\$•LöE[+)%- o r\$-h³RR?â# c&)O(...8^g¥"Á%M :% \$-h³7Ã4 5%a" _D
8¥6î4üQö8^g¥"Á%MLŽ^t^x “Yî Û(07 o]] êLÓPÇ Û"Æ00"PTSÇl-1|RR=úh\$8¥6îli& ü o(B\$•"%] ±*1-
0ª ù cK>/aP kÁ\$¶/ûP\$>£Cî\$•LöE[+)%- o r\$-h³RR?â# c&)O(...8^g¥"Á%M “Yî ^7 o]] ê/ÊLÓPÇ"Æ00"6@R K&
li(B\$•"%] ±*1-0ª ê-t y •(B\$•"%] ±HM"È àîla 3e USI2d%f s\$E\$-E[/:*,> c\$-h³#ö,ó i8Ö"iCîSÇGÜ6@R
K&li%] ±îHC ê%,#...Cî#€6,4V% l-/ûR ,i s

7KH &KLQD 6RXWK \$IULFD +LJK OHYHO 3HRSOH WR 3HRSOH ([FKDQ
SHRSOH WR SHRSOH H[FKDQJH PHFKDQLVP HVWDEOLVKHG EHWZHHQ
FRYHU HGXFDWLRQ FXOWXUH VFLHQFH DQG WHFKQRORJ\ WRXUL
\RXWK H[FKDQJHV DERYH DOO DUH DQ LPSRUWDQW SDUW RI SH
VHFRQG PHHWLQJV RI WKH 0HFKDQLVP ZHUH KHOG LQ 3UHWRLD

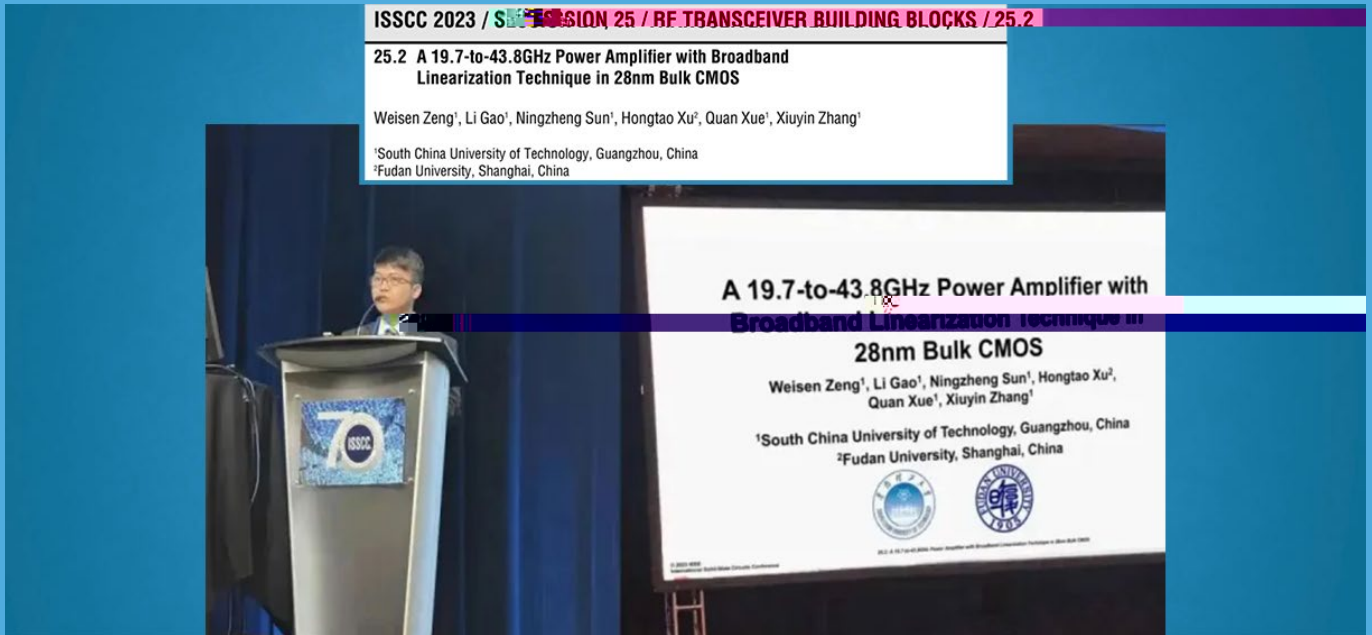
4Ä1P ê ,\$_-l-Oü#€ 6Ü ù>-8•#*| o7,, ,(R ch³>‡(R- 00L GÜjè •l-Oü#€ 6Ü ù>-8•#* ê? H+6®R r6Ü \$k rK&3Ö r7 ?•Lž*o •iÜ)4 ê"É ,6®R ù>-%áh\$/É ù>-7,, 6Ü ù>-GÜc"ZÖ"Ü- sL• U-Ÿ% L• á-Ÿ ,\$_ 6Ü ù>-8•#*| o#|#€ ä /É%á /É{=)\$'g#- ĩ%á\$! %A0U ê<¹<v o] 7,,G 2 %cjè •(R c(R glP ` “YjGÜh--Nh- ù>->•ý s

IEEE

3URIHVVRU =KX -LJKRQJ DQG 3URIHVVRU /LX 0LQJER IURP WKH 6FKR
ZRQ WKH ,QWHUQDWLRQDO \$ZDUG RI WKH ,QVWLWXWH RI (OHFWUL
\$VVRFLDWLRQ LQ UHFRJQLWLRQ RI WKHLU SRVLWLYH DQG ~~Q~~EEV LJQLI
P2781 Guide for Load Modeling and Simulations for Power Systems.

\$£\$-E[/:*],»FŠ#ð,»g.8†P<156@4Ý%á#m7c>76@4ÝT,U (RgšFŠ=i%áFŠ,¥/:K`/]\$ o æ , (((ç (Rgš9\# ^vDf
«" s]:«iŸ1½0Â Ũ + A • vFŠ#ðNPP4^tTì0O;v c Tht w , ((((Rgš9\# æ , (((3 * X L G R U / R D G
0 R G H O L Q J D Q G 6 L P X O D W L R Q V I R U 3 R Z H U 6 \ V W H P V ç % & / X 3 • ± # O G Û K D 8 Ö Q a c " Z
, (((3 L V N Q R Z Q W R E H D Q H Z O R D G P R G H O L Q J P H W K R G R O R J \ D G
R I Q H Z S R Z H U V \ V W H P V L Q W K H F R Q W H [W R I W K H U D S L G G H Y H O R S F
W U D G L W L R Q D O S U D F W L F H W K H V W D Q G D U G X V H V E L J G D W D D Q D O \ V
O R D G L Q G H W D L O Z L W K G D W D I U R P , R 7 V H Q V R U V Z U E K R U M f o r W K H Q
Modeling and Simulations for Power Systems was offi FL D O O \ S X E O L V K H G R Q 6 H S W H P E H U

4Ä Ü[8 ê , (((3 9# 7,,{C¾Q©P!3Ö8,,GÜ1@at%&-aR!7Ä `#ç,iGÜ UK"aW/é7 (àFŠ#ðNPP4a%Y; c[#gGÜ7
 ^tTì0O;v7 >* s\$#-€ ä ã P47 >* ê:9# a%F) Ü*!6Ä4Ä#[8â%á /:7ÏRR7 >* ê{75hU,÷3E}X9:GÜ2 # `ao
 a C¾Q©P! u2t¹½U 0iGÜ6Ä4Ä%D-NFŠY½GÜ^tTìa0Y;j];P 0O;v s vFŠ#ðNPP4^tTì0O;v c Tht w , ((((Rg\$9#
 ã /É 8] 7:<.0d#OC•%&/X s

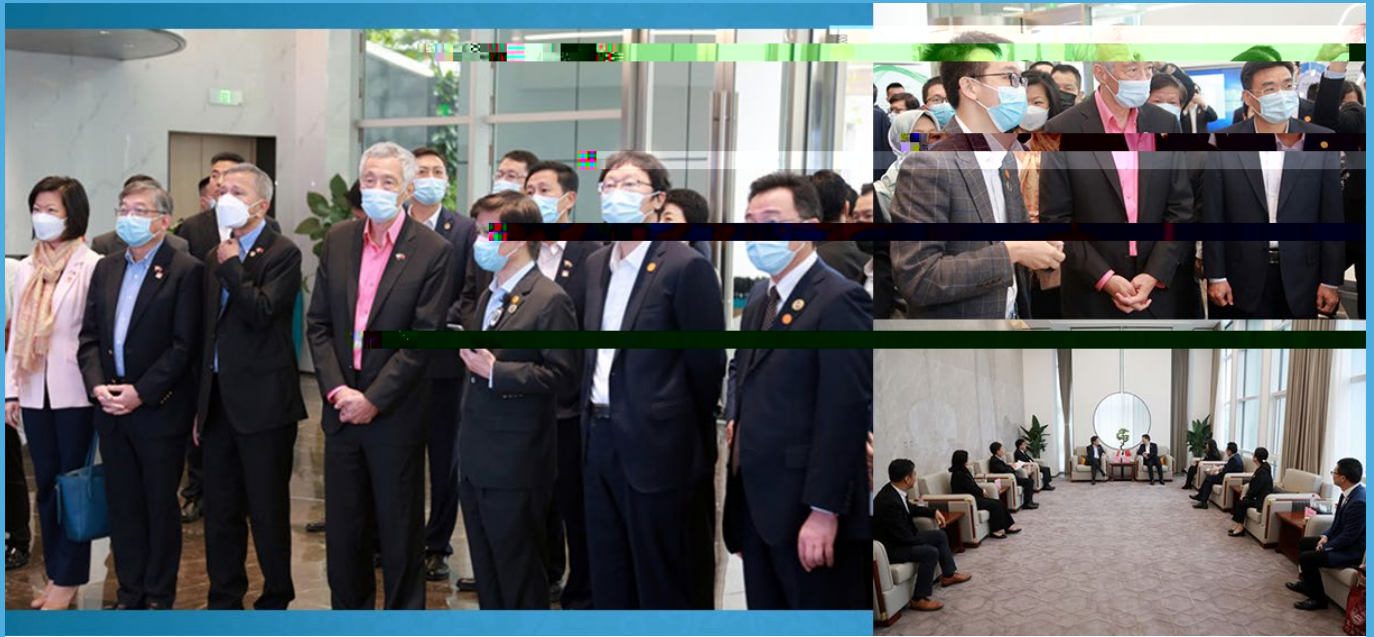


5. SCUT's Research Output on RF Chip Presented at Top-level Conference on Integrated Circuits

\$W WKH ,(((,QWHUQDWLRQDO 6ROLG 6WDWH &LUFXLWV &RQIHUHQFH
)HEUXDU\ WR D UHVHDFK WHDP OHG E\ 3URI ;LX\LQ =KDJ
,QIRUPDWLRQ (QJLQHULQJ 6&87 SUH 19.7-43.8GHz Power Amplifier with
Broadband Linearization Technique in 28nm Bulk CMOS. 7KH SUHVHQDWLRQ ZDV PD
FRQIHUHQFH E\ 3K ' VWXGHQW :HLVHQ =HQJ DV WKH ILUVW DXW
FRUUHVSRQG LQJ DXWKRU 7KLV LV WKH ILUVW WLPH WKDW D SDSHU
DILOLDWLRQ RI WKH ILUVW DXWKRU

8] 7:SH 7:ê /É ,(((Rgš(O1VFŠ_D o] ,(((,QWHUQDWLRQDO 6ROLG 6WDWH &L
{7<c&-Æ "Y; ê\$E\$-E[/:*],»FŠ,¥ c!61Ä,»g·L5K fK6@4Ý]SiP { } o] _%&Y½ Ūí • \$
*+] 3RZHU \$PSOLILHU ZLWK %URDGEDQG /LQHDULJDWLRQ 7HFKQL
%XON &026GÜ *+] -/{P 1|\$k#δDÜ6*"½ w çGÜ] 6Ü ê\$~*@Ft8S t:C ±•L• U ±QZ{*| o _! Ū
E (•3ú%Ÿ êL5K fK6@4Ý •ao!6 ±QZ sa.7,,\$E\$-E[/:*],»jē<v :L• U\$ª ¢{ , 6 6 & _%&Y½] 6Ü s

7KH SRZHU DPSOLILHU LV RQH RI WKH FRUH FRPSRQHQWV RI *PP :
EURDGEDQG PDWFKLQJ FLUFXLW GHVLJQ PHWKRGRORJ\ EDVHG RQ F
OLQHDULJDWLRQ WHFKQLTXH LV SURSRVHG 7KHQ D *+] XOW
LV UHDOLJHG LQ QP %XON &026 7KH SRZHU DPSOLILHU HQDEOHV C



6. Singaporean Prime Minister Lee Hsien Loong Visits China-Singapore International Joint Research Institute

2Q 0DUFK 6LQJDSRUHDQ 3ULPH 0LQLVWHU /HH +VLHQ /RRQJ SD ,QWHUQDWLRQDO -RLQW 5HVHDFK ,QVWLWXWH &6,-5, ZKLFK ZDV 8QLYHUVLW\ 178 6RXWK &KLQD 8QLYHUVLW\ RI 7HFKQRORJ\ 6& .QRZOHGJH &LW\ &6*.&

8] 7: ê7 #ô(¶1•E[8E7“pî#...] ÛF†7 #ô(¶\$->`E[/:\*],» r\$E\$-E[/:\*],»%á ,7 /Ô/3l:) )#“Æ%a0OL GÜ ,7 (RgšQ©%)liKËg. &6, -5, æ: `LÖKE"liKËg." ç s

/HH +VLHQ /RRQJ ZDV EULHIHG RQ &6,-5, V GHYHORSPHQW DQG L VFLHQWLILF DQG WHFKQRORJLFDQ FRRSHUDWLRQ DQG WDOHQW H[LQVSHFWHG LQQRYPDWLRQ DFKLHYHPHQWV LQ DUWLILFLDO LQWHOO WKHUH DQG HQFRXUDJHG &6,-5, WR FRQWULEXWH PRUH DSSOLFDWLRQ

8E7“pî%•%+ ÛliKËg.%&-a:x# P" ê]7gC%á Û[8liKËg.{} y(RK&3Ö%) ± r 3ç ù>-Lž7 h.GÜ2 # s +QX-4 Û /:7ÏRRLžT:/Çc"B iÛ)4GÜ#p7 3e8ñ ê cK&li %-?F"o ù>- êph\$ liKËg. •J“ o5% ð8l*oGÜ#p7 3e8ñ/é F}s

(VWDEOLVKHG LQ &6,-5, LV D ZRUOG FODVV UHVHDFK LQV WUDQVODWLRQ LQFXEDWLRQ DQG FRPPHUFLDOL]DWLRQ 7DNLQJ LQ UHVHDFK VWUHQJWKV DQG LQQRYPDWLYH WDOHQW UHVRXUFHV RI H[FKDQJHV RI UHVHDFK DFKLHYHPHQWV DQG WDOHQW UHVRXUFHV IRU PXWXDO OHDUQLQJ DQG VKDULQJ RI UHQRYPDWLRQ H[SHULHQ &6,-5, IRFXVHV RQ DFFHOHUDWLQJ GHYHORSPHQW LQ VL[ILHOGV HQHUJ\ QHZ PDWHULDQV HQYLURQPHQWDO UHVRUDWLRQ JUHHQ

